DEC 4 - 1931

NOVEMBER 1931

Journal of Educational Research

Registered June 4, 1929

CONTENTS

	PAGE
The Achievement of Gifted Children Enrolled and Not Enrolled in Special Opportunity Classes — *Howard A. Gray* and *Leta S. Hollingworth*	255
The Retention of Information Learned in College Courses — *Edward B. Greene*	262
Early School Superintendents in New Orleans — *Stuart G. Noble*	274
Factors Which Determine the Effectiveness of Weighting — *Douglas E. Scates* and *Forest R. Noffsinger*	280
A Statistical Study of a New Type of Objective Examination Question — *Grace Holmes* and *Edna Heidbreder*	286
Trends in Evening School Education in St. Louis, 1859 to 1928 — *Mildred Fletcher* and *R. C. Fletcher*	293
Shorter Articles	299
Editorials	308
Reviews	310
Research Abstracts and Bibliographies	317
Research News and Communications	324

THE JOURNAL OF EDUCATIONAL RESEARCH is indexed in the Education Index

---

Copyright 1931, by Public School Publishing Co.

Entered as second-class matter at the Post Office at Bloomington, Illinois, under the act of March 3, 1879

JOURNAL OF EDUCATIONAL RESEARCH

EDITORIAL BOARD

E. J. ASHBAUGH, *Dean, School of Education and Professor of Education, Miami University, Oxford, Ohio*

A. S. BARR, *Chairman, Editorial Board, Professor of Education, University of Wisconsin, Madison, Wisconsin*

CARTER V. GOOD *Professor of Education, University of Cincinnati Cincinnati, Ohio*

ASSOCIATE EDITORS

FRED C. AYER, *Professor of Educational Administration, University of Texas, Austin, Texas*

HARRY J. BAKER, *Director, Psychological Clinic, Detroit Public Schools, Detroit, Michigan*

FOWLER D. BROOKS, *Head of Departments of Education and Psychology, DePauw University, Greencastle, Indiana*

B. R. BUCKINGHAM, *Lecturer in Education, Harvard University, Cambridge, Massachusetts*

W. W. CHARTERS, *Director, Bureau of Educational Research and Professor of Education, Ohio State University, Columbus, Ohio*

VIRGIL E. DICKSON, *Assistant Superintendent of Schools and Director of Bureau of Research and Guidance, Berkeley Public Schools, Berkeley, California*

CHARLES FORDYCE, *Assistant Director, Bureau of Educational References and Research, University of Nebraska, Lincoln, Nebraska.*

WILLIAM S. GRAY, *Dean, School of Education and Professor of Education, University of Chicago, Chicago, Illinois*

CHARLES E. GREENE, *Director of Research, Denver Public Schools, Denver, Colorado*

M. E. HAGGERTY, *Dean, College of Education and Professor of Education, University of Minnesota, Minneapolis, Minnesota*

V. A. C. HENMON, *Chairman, Department of Psychology and Professor of Psychology, University of Wisconsin, Madison, Wisconsin.*

KARL J. HOLZINGER, *Professor of Education, University of Chicago, Chicago, Illinois.*

ERNEST HORN, *Director, University Elementary School and Professor of Education, State University of Iowa, Iowa City, Iowa*

EARL HUDELSON, *Dean, College of Education and Professor of Education, West Virginia University, Morgantown, West Virginia*

ARTHUR W. KALLOM, *First Assistant Director, Department of Educational Investigation and Measurement, Boston Public Schools, Boston, Massachusetts*

FREDERICK J. KELLY, *Chief, Section of Colleges and Professional Schools, Office of Education, Department of the Interior, Washington, D. C.*

WILLIAM A. McCALL, *Professor of Education, Teachers College, Columbia University, New York City*

EUGENE A. NIFENECKER, *Director of Reference, Research, and Statistics, Board of Education, 500 Park Avenue, New York City*

W. J. OSBURN, *Director of Research, State Department of Education, and Professor of School Administration, Ohio State University, Columbus, Ohio*

SHELTON PHELPS, *Director of Instruction and Professor of Education, George Peabody College, Nashville, Tennessee*

DOUGLAS E. SCATES, *Director, Research and Statistics, Cincinnati Public Schools, Cincinnati, Ohio*

JESSE B. SEARS, *Professor of Education, Stanford University, California*

JOHN L. STENQUIST, *Director, Bureau of Educational Research, Department of Education and Lecturer, Johns Hopkins University, Baltimore, Maryland*

GEORGE D. STRAYER, *Director, Division of Field Studies, Institute of Educational Research, and Professor of Education, Teachers College, Columbia University, New York City*

PERCIVAL M. SYMONDS, *Associate Professor of Education, Teachers College, Columbia University, New York City*

W. W. THEISEN, *Assistant Superintendent of Schools, Milwaukee, Wisconsin*

M. R. TRABUE, *Executive Secretary of the Committee on Individual Diagnosis and Training, Institute for Employment Stabilization Research, University of Minnesota, Minneapolis, Minnesota*

W. L. UHL, *Dean, School of Education, and Professor of Education, University of Washington, Seattle, Washington.*

CARLETON W. WASHBURNE, *Superintendent of Schools, Winnetka Public Schools, Winnetka, Illinois*

GUY M. WHIPPLE, *Secretary, National Society for the Study of Education, Danvers, Massachusetts.*

CLIFFORD WOODY, *Director, Bureau of Educational Reference and Research and Professor of Education, University of Michigan, Ann Arbor, Michigan*

THE JOURNAL OF EDUCATIONAL RESEARCH is published at Bloomington, Illinois, monthly, except July and August by the Public School Publishing Company. The subscription price is $4.00; $4.20 in Canada or Mexico; and $4.50 in other foreign countries.

Subscriptions and all communications about reprints or other business matters should be addressed to the PUBLIC SCHOOL PUBLISHING COMPANY, at Bloomington, Illinois.

Address all communications on editorial matters to A. S. Barr, Department of Education, University of Wisconsin, Madison, Wisconsin.

JOURNAL *of* EDUCATIONAL RESEARCH

Volume XXIV NOVEMBER 1931 Number 4

THE ACHIEVEMENT OF GIFTED CHILDREN ENROLLED AND NOT ENROLLED IN SPECIAL OPPORTUNITY CLASSES

HOWARD A. GRAY
Electrical Research Products, Inc., New York City
and
LETA S. HOLLINGWORTH
Teachers College, Columbia University

It is the purpose of this article to present comparative achievement in standardized school subjects of two groups of exceptional children all testing at or above 130 I.Q. (Stanford-Binet).* One of these groups was segregated in two special classes for purposes of instruction, while the pupils of the other group were mixed in the usual manner and as chance would dictate, among heterogeneously composed classes.

FORMATION OF COMPARATIVE GROUPS

A group of young children, all testing at or above 130 I.Q. (S-B), was segregated in 1922, in New York City, to form special opportunity classes.[1, 2] This was done by testing children throughout the city who showed indications of unusual brightness. The age limits set were between the seventh and the ninth birthdays.

Children thus selected were given an opportunity to advance in the prescribed subjects of the elementary school at their own pace. Supplementing these activities, much enrichment was provided in the form of intellectual work not included in the regular curriculum. During three

* These data were gathered as part of the work of a joint committee for three years in charge of experimental classes, at Public School 165, Manhattan, New York City. The members of the committee were Mr. Jacob Theobald and Miss Jane E. Monahan, of Public School 165; Miss Margaret V. Cobb, Dr. Grace A. Taylor, and Prof. Leta S. Hollingworth, of Teachers College, Columbia University. The study was in part supported by funds granted by the Carnegie Corporation of New York.

[1] Cobb, Margaret V., et al. "The Special Opportunity Class for Gifted Children." New York: Public School 165, Manhattan. *Ungraded.* VIII (March, 1923), pp. 121-128.

[2] Theobald, Jacob. *Two Special Opportunity Classes at P. S. 165, Manhattan.* New York: Board of Education. 1930.

years of attendance upon the special classes, these children covered, in addition to required subjects, the following: conversational French; biography;[3] the history of civilization, with reference to food, water, clothing, shelter and sanitation; much extra work in science, mathematics, English composition and music.

All of this enrichment was carried out during regular school hours, in addition to study of the tools of literacy, such as are measurable by the Stanford Achievement Test, the instrument used by us to obtain our quantitative comparison of the two groups considered. On the whole, about half of the regular school time was given to the prescribed subjects, and about half to the various forms of enrichment mentioned. These pupils, divided into classes, had for three successive years the same two classroom teachers selected from among those assigned regularly to Public School 165, Manhattan. Also, they had six special teachers at various periods who worked in connection with the enrichment. The classroom teachers were selected from those available, for their ability to teach and for their interest in experimental education.

The comparative group herein considered was composed of children similar in age and in intellectual capacity to those of the segregated group just described. These pupils were, however, at no time segregated in special classes, but attended the regular grades of the elementary schools with heterogeneous grouping. They were registered in a variety of schools scattered over New York City, were not acquainted with each other, and were never assembled as a group, except on paper. Of the thirty-six pupils composing this group, twenty-nine were in public schools, three in private schools, and four in model schools attached to training schools for teachers.

It is now becoming somewhat widely known that pupils who attend private and model schools are to a considerable extent selected on the basis of superior intelligence.[4, 5, 6] Thus some of the children included in the comparative group were probably working with classmates whose median I.Q. fell at about 115, instead with the more thoroughly hetero-

---

[3] Hollingworth, L. S. "Introduction to Biography for Young Children Who Test Above 150 I.Q." *Teachers College Record*, XXVI (December, 1924), pp. 277-287.

[4] Fenton, N., and Howard, L. S. "The Challenge of the Private School," *Journal of Educational Research*, IX (January, 1924), pp. 22-28.

[5] Rogers, Agnes, et al. *Classification of Children in Private Schools.* Philadelphia: Private School Teachers' Association, Pamphlet No. 2. 1927.

[6] Dearborn, W. F., and Cattell, P. "The Intelligence and Achievement of Private School Pupils," *Journal of Educational Psychology*, XXI (March, 1930), pp. 197-211.

geneous groups attended by the twenty-nine who went to public schools. In any case, however, these thirty-six pupils worked in very heterogeneous classes, as compared with the pupils in the segregated group. As a group, the former studied without special enrichment of the curriculum. They devoted the whole school day to the conventionally prescribed subjects of study, such as are included in the Stanford Achievement Test. They had about two hundred different teachers during the three years of experimentation, for in only a few cases did any two of them have at any time the same teacher.

APPLICATION OF ACHIEVEMENT TESTS

Measurements by means of the Stanford Achievement Tests were made in June, 1925, after three years of experimentation, upon the pupils of both groups. The results are summarized in Table I.

E.Q.'s in the various subjects, and for the composite, were calculated *for each individual of each group,* dividing the educational age by the chronological age, the former factor being determined by reference to the *age norms* for the 1922 edition of the Stanford Achievement Test. The A.Q.'s were then determined *for each individual of each group,* by finding the ratio between the I.Q. (Stanford-Binet) and the E.Q. (Stanford Achievement Test).

Whatever may be the objections to the A.Q. from the standpoint of statistical refinement, these objections are the same for both groups, and leave an understandable comparison. Since both groups were of the same status as regards I.Q., the comparison is valid for determining whether either group excels the other in use of capacity, under the different conditions provided, in respect to the subjects measured.[7]

COMPARISON OF THE GROUPS

Of the various questions which may arise on the basis of data such as these, this report will be concerned with two:

(1) Will the pupils attending the regular classes of the elementary school show lower accomplishment quotients in subjects measurable by the Stanford Achievement Test, as compared with the segregated group?

The answer to this question, furnished by Table I, is, no. Upon the achievements measurable by the Stanford Achievement Test there is no appreciable detrimental effect of regular class conditioning of the group receiving that type of instruction.

[7] Keys, Noel, and Whiteside, G. H. "The Relation of Nervous-Emotional Stability to Educational Achievement," *Journal of Educational Psychology,* XXI (November, 1930), pp. 429-441.

TABLE I

MEAN EDUCATIONAL AND ACHIEVEMENT QUOTIENTS OF NINETY-TWO BRIGHT CHILDREN ENROLLED AND NOT ENROLLED IN SPECIAL OPPORTUNITY CLASSES, SHOWING P.E.$_m$, S.D., AND RANGE IN EACH INSTANCE. ALSO, THE DIFFERENCES BETWEEN GROUPS

	Regular Class Group N=36							Opportunity Class Group N=56										
Standard Achievement Test	Mean E.Q.	P.E.m	S.D.	Range	Mean A.Q.	P.E.m	S.D.	Range	Mean E.Q.	P.E.m	S.D.	Range	Mean A.Q.	P.E.m	S.D.	Range	Diff. E.Q.	P.E.d	Diff. A.Q.	P.E.d
Reading—Paragraph Meaning	153.9±1.6		15.5	132–187	103.9±1.2		11.4	84–132	152.3±1.4		15.6	112–182	99.4± .9		9.6	68–127	1.6	2.13	4.5	1.50
Sentence Meaning	152.5±1.6		15.0	122–187	102.8± .9		8.3	82–122	155.5±1.7		19.0	100–182	99.6± .9		9.9	100–121	3.0	2.33	3.2	1.27
Word Meaning	149.5±1.6		14.1	121–184	101.0±1.1		10.1	81–130	150.2±1.3		15.3	101–210	96.6± .8		9.1	60–117	0.7	2.06	4.4	1.42
Total Reading Score	151.9±1.0		9.7	130–185	102.4±1.1		9.1	86–132	152.0±1.2		14.1	119–178	97.0±1.2		13.7	70–117	0.1	1.56	5.4	1.63
Arithmetic—Comprehension	151.0±2.3		20.4	104–193	100.6±1.5		13.8	72–132	155.4±1.0		11.1	111–195	99.6± .9		10.2	65–118	4.4	2.51	1.0	1.75
Arithmetic—Reasoning	151.0±2.1		19.4	119–210	100.5±1.3		12.6	81–152	153.0±1.1		12.3	126–204	98.2± .8		10.1	77–112	2.0	2.37	2.0	1.53
Total Arithmetic Score	153.2±2.0		17.7	120–200	100.4±1.4		12.8	81–142	156.1±1.2		13.7	121–201	100.7± .9		10.1	79–137	2.9	2.33	0.3	1.66
Nature Study	145.0±1.7		16.4	106–179	98.5±1.1		10.2	84–124	144.3±1.2		13.9	109–172	93.9± .8		8.5	69–117	0.7	2.08	5.6	1.36
History and Literature	152.5±1.3		12.0	132–182	100.3±1.1		9.2	85–126	155.8± .9		10.9	132–184	100.4±1.1		9.0	81–127	3.3	1.58	0.1	1.56
Language Usage	148.7±2.2		20.1	100–189	100.3±1.3		11.8	76–132	147.5±1.4		16.6	105–190	96.1± .9		9.4	66–117	1.2	2.60	4.2	1.58
Dictation	149.3±1.4		16.4	122–197	100.8±1.3		12.2	76–133	153.5±1.0		13.1	111–182	99.8± .8		8.8	79–119	4.2	1.72	1.0	1.53
Composite Score	150.5±1.6		14.4	121–187	99.7±1.1		10.6	76–133	153.0±1.1		13.0	119–183	99.1± .7		8.2	74.113	2.5	1.94	0.6	1.30
Chronological Age (Months)	Mean=132.9±1.7		S.D.=15.2		Range 97–157				Mean=138.5± .6		S.D.= 6.5		Range 109–150							
Intelligence Quotient	Mean=151.2±1.2		S.D.=11.0		Range 134–177				Mean=157.1±1.2		S.D.=13.0		Range 137–190							

(2) Will enrichment of the curriculum in the case of gifted children, segregated for instruction, cause them to fall low in the ordinarily prescribed subjects, as compared with those who attend regular classes without enrichment of curriculum?

The answer to this question is also, no. There is no appreciable effect upon standardized accomplishment, of the extra work done by the segregated group, save possibly in the cases of nature study and reading. In these cases the difference between the AQ's of the groups compared is more than three times the probable error in favor of the regular class group. It is true that in nine of the eleven school subjects mentioned, the pupils in regular classes average a little higher in AQ, and this difference in direction should be noted, as well as the differences in amount. The differences in amount, however, are insignificant; and it is to be noted also that the pupils of the segregated group are a little older and a little brighter, on the mean, so that possible handicaps from maximum and near-maximum scores on the achievement tests would tend to be more pronounced for this group. *Exact pairing* for birthday age and for IQ might easily eliminate the tendency for the slight differences to take the same direction. Thus, though covering a large amount of intellectual work *in addition to that performed by the pupils in regular classes*, the segregated pupils show no deficit in the achievements measured by the Stanford Achievement Test. They do as well in these subjects (with the possible exception of nature study and reading) as do the children of similar ability who regularly had the whole school day for study of the ordinary curriculum.

RELATION OF THE FINDINGS TO PREVIOUS STUDIES

No study exactly like this one in all details has been previously reported. There are, however, several previous investigations to which the results may be related.

Moyer[8] compared the achievement of high-school pupils grouped into classes rendered relatively homogeneous by the use of intelligence tests, with that of pupils similar in ability who were taught in heterogeneous classes, in respect to algebra and Latin. It was found that "superior pupils and medium pupils appear to do appreciably better in segregated than in mixed classes," while with pupils of inferior intelligence segregation makes no difference in achievement.

[8] Moyer, Edward L. "A Study of the Effects of Classification by Intelligence Tests," *Twenty-Third Yearbook, Part I.* National Society for the Study of Education. 1924.

Cook[9] grouped pupils in the Topeka High School on the basis of the Terman Group Test of Mental Ability combined with grades in subjects for the previous term. Groups thus rendered homogeneous were taught and tested for one term in English, geometry and ancient history. The investigator concluded that the grouping of high-school pupils according to ability cannot be said to secure better results than random grouping, insofar as scores on tests of achievement in these subjects are concerned. "Pupils of superior ability in geometry did better work in mixed classes than they did in selected groups. Their history scores were much higher than the scores of pupils of the same ability in mixed classes. In English the differences were so small as to be negligible."

Jones and McCall[10] studied two groups of elementary school children, both clustering at 124 I.Q., with an S.D. of 12.2, one group segregated into a homogeneous class, the other unsegregated. At the end of a two-year period the segregated group showed an accomplishment quotient of 102.33; the non-segregated, an accomplishment quotient of 97.19. In terms of time, the segregated group gained 7.14 months in educational age over the non-segregated, in the subjects measured. This study is like our own here presented, in that it deals with pupils of elementary school age, of superior intelligence, over a considerable period of time. It differs from our study in that the children involved were by no means as gifted as those included in our comparative groups.

Worlton[11] studied pupils in Salt Lake City, with I.Q.'s of 90 or above, in grades 4B to 7B, inclusive. The average performances on four standard tests of achievement, showed pupils to do appreciably better under conditions of homogeneous grouping on the basis of intelligence.

Witty[12] administered the Stanford Achievement Test, Form A, to one hundred children at or above 140 I.Q. (S-B), who were being taught in the usual heterogeneous groups, in Kansas City and towns in Kansas. The mean I.Q. of this group, widely scattered as to locality, was 152.

---

[9] Cook, R. R. "A Study of the Results of Homogeneous Grouping of Abilities in High-School Classes," *Twenty-Third Yearbook, Part I.* National Society for the Study of Education. 1924.

[10] Jones, Vernon A., and McCall, Wm. A. "Application of Two Techniques in Evaluating Some Policies of Dealing with Bright Children," *Teachers College Record*, XXVII (May, 1926), pp. 825-835.

[11] Worlton, J. T. "The Effect of Homogeneous Classification on the Scholastic Achievement of Bright Pupils," *Elementary School Journal*, XXVIII (January, 1928), pp. 336-345.

[12] Witty, Paul A. *A Study of One Hundred Gifted Children.* Bulletin of the University of Kansas, Vol. 2, No. 7, 1930.

The mean E.Q. was 136, indicating a trend toward accomplishment quotients well below 100. The subject quotients for these unsegregated gifted children ran as follows:

Subject	Subject Quotient	Subject	Subject Quotient
Reading 1	143	Arithmetic 2	132
Reading 2	142	Nature Study and Science	137
Reading 3	143	History and Literature	132
Arithmetic 1	136	Spelling	131

The two studies most nearly like our own, those of Jones and McCall, and Witty, do not agree with ours in results. Witty found the unsegregated gifted, for whom no particular provision had been made, to have achieved in tool subjects substantially less than they were able to do. Jones and McCall found their unsegregated pupils of superior intelligence to learn much less in two years of schooling in the tool subjects than did their segregated pupils. We find, with our pupils, on the whole, no statistically significant difference in achievement as a result of homogeneous grouping, so far as tool subjects are concerned.

On the other hand, our results are like those of Cook, who found no clear effect of homogeneous grouping upon achievement in subjects taught in high school.

SUMMARY

Comparison of A.Q.'s, individually determined, of children who test above 130 I.Q. (Stanford-Binet) show that:

(1) In the case of gifted children, accomplishment in the subject matter represented by the Stanford Achievement Test is very superior, in accordance with intelligence, no matter whether the children are segregated for instruction or scattered about in heterogeneous groups.

(2) Gifted children may cover a large amount of intellectual work in addition to that of the ordinarily prescribed school subjects, without detriment to their achievement in the latter.

(3) The advantages to be hoped for from the homogeneous grouping of gifted children lie not so much in expectation of greater achievement in the tool subjects (reading, arithmetic, spelling) as in an enrichment of scholastic experience with additional intellectual opportunities. What these additional opportunities should be is a matter for discussion and experimentation among educators.

(4) In view of the disagreement among the results of studies of the effect upon prescribed subjects of homogeneous grouping of highly intelligent children, the question cannot be considered closed, but is open to more extensive investigation.

THE RETENTION OF INFORMATION LEARNED IN COLLEGE COURSES[1]

EDWARD B. GREENE
University of Michigan

THE PLAN

IN two beginning courses, zoology and psychology, and in one advanced course, physiological chemistry, the itemized part of the final examination of June was repeated the following October during the first week of school for students who enrolled for advanced courses. These students all had only the beginning courses at Michigan or elsewhere. In order to ascertain how much students who were just beginning the elementary courses knew of the subject matter to be covered, they were given the same examinations.

THE COURSES

The methods of conducting the courses differed as follows:

The zoology course emphasized laboratory work, and used a text which was designed to supplement the laboratory manual. Three two-hour laboratory periods and two one-hour recitation periods were required per week. There were no lectures. The average group contained about thirty students. The course has undergone only minor changes during the last three years.

The psychology course on the other hand emphasized the lectures which followed fairly closely a general psychological text. Students met once a week in a large lecture group, and also in two one-hour recitation periods. There were no laboratory periods. The textbook and the lecturer have not been changed for the last three years, but a few changes in order and emphasis have taken place.

The physiological chemistry course begins in February and continues until the following February. The June examination, therefore, was concerned only with the first semester's work. This consisted of two one-hour lectures per week. The laboratory work for this course consists of twenty-four hours per week for a period of eight weeks during the fall semester.

[1] This report was made possible by the interest and coöperation of Profs. H. B. Lewis, W. B. Pillsbury, H. F. Adams, P. O. Okkelberg, A. F. Shull, A. E. Woodhead, W. C. Trow, H. Y. McClusky, K. B. Greene, and A. Ford, all of whom gave considerable thought and time to this work. The tests were prepared by the staffs of the various departments.

THE TESTS

These courses have for some time used itemized tests such as the completion, true-false, multiple choice, and labeling varieties. The distribution of items is shown in Table I. The scoring with a few exceptions allowed one point credit for each correct answer. To allow for direct comparison, the raw scores have been changed into percent of total items in the test.

TABLE I

DISTRIBUTION OF TEST ITEMS ACCORDING TO TYPE OF QUESTION

	Zoology	Psychology	Phys. Chem.
Completion	113	81	61
True-False	125	0	20
Multiple choice	104	23	29
Labeling	0	34	0
Total	342	138	110

Note:

1. This table may be read thus: In the zoology examination there were 113 items of the completion type, 125 of the true-false type, and 104 of the multiple choice type.
2. The opportunities for success by pure chance are 50 in 100 times in the true-false test, about 30 in 100 in the multiple choice test, and about 0 in 100 for the completion and labeling tests. It is evident that the psychology examination contained fewer opportunities for chance success than the other two examinations.

No one would claim that these tests measure the entire products of the courses. Their emphasis is upon the recall or recognition of specific information, rather than problem solving or logical organization of material. These kinds of tests have been shown to correlate highly with scores on other types of examinations such as the essay type. Wood[2] found a positive correlation of .840 in the measurement of law school work between itemized and essay examinations. In the present instance, the psychology itemized test correlated .84 $\pm$ .08 with the total grade in the course. Probably this sort of correlation would hold true for retests as well as for the situations already studied. At present this information is lacking. Essay type tests were not used in this study because of the difficulty of securing accurate numerical grades.

It is also well to remember in this connection that one of the best measures of retention is probably the length of time needed for relearning. In this study we have found no opportunity to secure such measures, but we hope to do so in the future. Since only approximately one-third of the students who complete the elementary zoology course and one-half of those who complete the elementary psychology course ever enroll for an advanced course in these departments, complete measures of relearning will be hard to get.

[2] Wood, Ben D. *Measurement in Higher Education.* (Yonkers, New York: World Book Co., 1923), p. 4.

The reliability of these examinations as shown by the odd-even correlation coefficients, ranges between .55 and .85 with the mean reliability at .68. Such reliability coefficients indicate that these tests are as consistent as the standard "tool" subject tests in mathematics and language used in general mental scales.[3] Another article is in preparation which will deal with the analysis of the items on the final examination and on the retest.

THE SUBJECTS

In all there were 1064 students, who coöperated in the testing schedule, distributed as follows: zoology 407, psychology 525, and physiological chemistry 130. The zoology students were nearly all freshmen, the psychology course enrolled approximately 60 percent sophomores, 37 percent juniors, and 3 percent seniors. Both of these courses have about 65 percent men and 35 percent women. The physiological chemistry course results are all from first year medical students, two percent of whom were women.

The students who appeared for retests in October were not representative of the entire June selection, due to the fact that the poorer students do not attempt advanced work. The retests were only given in one advanced zoology course, and in three psychology courses, while the chemistry students were merely continuing the last half of a one-year course. A comparison of the grades of all elementary students with the grades of those who took advanced work is shown in Table II. An inspection of this table shows that in the zoology and psychology work there are about twice as large a proportion of A and B students in the

TABLE II

DISTRIBUTION OF GRADES OF ELEMENTARY AND ADVANCED STUDENTS

Grade in Beginning Course	Zoology		Psychology		Phys. Chem.	
	All	Advanced	All	Advanced	All	Advanced*
A	9.6%	20.8%	10.9%	29.1%	10.1%	12.0%
B	25.5%	49.1%	29.5%	35.7%	30.2%	28.0%
C	47.1%	24.5%	43.0%	34.2%	47.0%	55.0%
D	12.9%	5.6%	6.8%	1.0%	9.0%	5.0%
E	3.0%	0	3.5%	0	3.7%	0.0%
Other	1.9%	0	6.3%	0		
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* Estimated by writer.

Note: This table may be read: In the zoology course 9.6 percent of all the beginning group received a grade of A at the end of the semester, 25.5 percent a grade of B, etc. Of the students who later took advanced courses 20.8 percent received a grade of A in the beginning course, 49.1 percent a grade of B, etc.

[3] Ruch, G. M. *The Improvement of the Written Examination.* (Chicago: Scott, Foresman & Co., 1924), p. 119.

advanced sections as there are in the elementary sections. It was not possible to get measures of learning ability of these students, although the writer is aware that no study of retention is complete without such measures.

RESULTS

The results will be shown under three headings: first, the distribution of scores in the various groups tested; second, the correlation between June and October scores of students who took both tests; and third, the comparison of this study with studies made by other investigators.

1. *General Distribution of Scores.*—Table III shows very marked similarities in the results of all three courses; the relative amounts of retention at various periods; the amounts of overlapping between groups; and the success of students who had studied courses of the same character at other institutions.

TABLE III

RETENTION OF INFORMATION BY COLLEGE GROUPS

Group	Zoology			Psychology			Phy. Chem.		
	No.	Percent*		No.	Percent*		No.	Percent*	
		Av.	Sigma		Av.	Sigma		Av.	Sigma
1. Final Examination: All	207	67	14.6	259	60	14.8	113	71	7.4
2. Final Exam. Advanced	13	76	8.7	26	70	8.8	88	80	7.7
3. Four Months Retention	13	42	14.7	26	42	10.2	88	48	8.7
4. Eight Months Retention	10	44	13.9	13	26	16.2	..	..	..
5. Sixteen Months Retention	20	37	10.9	23	25	7.2	..	..	..
6. Twenty Months Retention	17	32	11.0	12	24	7.1	..	..	..
7. High School Training	52	20	14.4	..	..	...	..	..	..
8. Other College Training	36	22	11.7	42	16	8.1	..	..	..
9. No Previous Training	54	15	7.3	82	7	5.8	140	11	6.4

* Percent indicates the average percent correct of the total possible score.

Note:

1. No students were included in this table who had completed more than the initial course.
2. All groups were tested in October 1929 except Group 1 and 2 in June 1929.
3. This table may be read thus: In zoology 207 of the students who finished the elementary course averaged 67 percent of the total possible score with a standard deviation of 14.6 percent.
4. Group 2 consists of those students who were retested four months later. The personnel of Groups 2 and 3 is therefore identical. These are the students referred to in Table 2 as "Advanced."

An inspection of Table III and Diagram 1, groups 2 and 3, shows that the loss from June to October was 34 points in zoology, 28 in psychology and 32 in chemistry. If we allow for the initial learning of these advanced students, which would probably be from 5 to 10 points above the average initial scores shown in Table III, group 9, it would

appear that these students have lost approximately one-half of the information which they reported correctly on their June examinations.

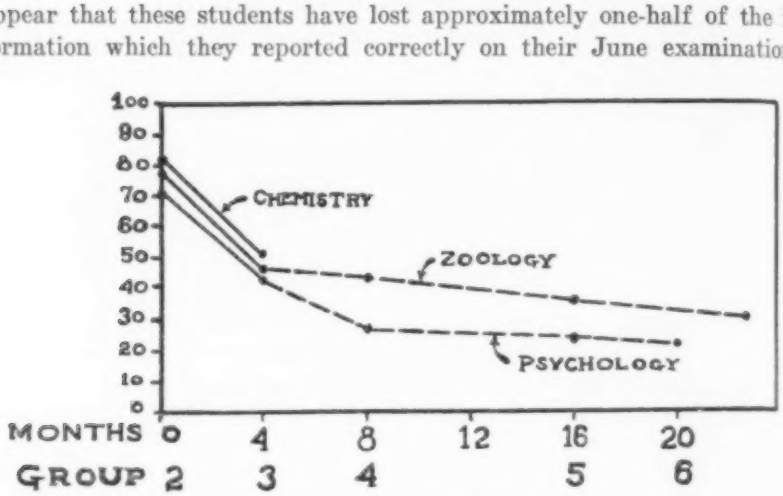

DIAGRAM 1. RETENTION OF INFORMATION: COLLEGE PSYCHOLOGY, ZOOLOGY, AND PHYSIOLOGICAL CHEMISTRY
Average Percent Correct of Total Possible Score

If we take as a standard the sigma of the distribution on the final examination, group 2 in Table III, then the zoology students dropped down an average of four sigma in four months, and five sigma in twenty months. The psychology students, four months later, fell about three sigma below the June average, and eight months or more after the completion of the course fell about five sigma below. The physiological chemistry students averaged four sigma below the June scores in October.

The proportion of the final examination scores which was retained eight months later averages roughly one-quarter for zoology and one-fifth for psychology, and at the end of twenty months this would average from one-tenth to one-fifth. It should be stressed that these results are only suggestive because the test items which were used as units of measurement are not strictly comparable, and because of the small numbers of students involved in a single group. It should also be remembered that these students were considerably above the average of the total enrollment in the beginning courses not only in ability but also in specific interest. The average students would probably forget more rapidly.

The reasons for the differences in retention between zoology, psychology, and chemistry are not clear. It has been suggested that the laboratory method may be more efficient than the lecture presentation, but this conclusion is not justified from this study because no direct

comparison has been made. The chemistry scores are slightly higher than either the zoology or the psychology scores. These differences may be due to any or all of the following factors:

1. Differences in methods of instruction which might cause variations in retention; such as rote drill, problem solving, coaching, distribution of repetitions, etc.
2. Differences in content of instruction and examinations; such as more time spent in one topic than another.
3. Differences in the amount of transfer and inhibition from accompanying or succeeding studies or activities.
4. Differences in the amount of previous knowledge of students. These might be due to changes in high school courses, etc.
5. Variation in the native abilities of students.
6. Differences in the type of test question.
7. Differences in motivation.

The incidence of these differences will only appear from a more thorough and carefully controlled study.

A comparison of the scores made at the beginning and end of the courses shows that in both psychology and zoology only the students falling in the highest two percent exceed on the preliminary test the scores made by the students of the lowest two percent on the final test. This is in contrast to the results given for Educational Psychology by Worcester[4] who found on a preliminary test that the highest quarter of students averaged above the lowest quarter of students on the same test at the end of the course.

In evaluating the work of students who had taken courses elsewhere, it appears in Table III, groups 7 and 8, that a high school biology course raised the average only five points above those who had had no previous formal training. A college course in zoology at some institution other than the University of Michigan raised the average score only seven points above those who had taken no zoology. A college course in psychology at some other institution raised the score only nine points above the average of those who had never taken a psychology course. About eighty percent of the students who had taken work at other institutions had completed this work within four months of the retests given in this series, approximately ten percent had completed this work within eight months, and the rest within sixteen months. If we take as a standard the sigma of the distribution of the final examination scores, group 2, Table III, then the students bringing zoology from other colleges, Group 8,

[4] *Research Adventures in University Teaching.* (Bloomington, Illinois: Public School Publishing Co., 1927), pp. 35-66.

were more than six sigma below the standard; in psychology they averaged six sigma below the June results. It should be remembered, however, that the contents and methods of teaching used in various institutions differ so much that these scores are not very indicative of a student's ability or interest.

2. *Correlation between June and October Scores.*—The correlation coefficients between the June and October scores, using the Pearson Product-Moment formula were:

Zoology	.708 P.E.	± .082	N = 15
Psychology	.412 P.E.	± .121	N = 26
Chemistry	.434 P.E.	± .062	N = 88

The wide range of the June-October coefficients probably indicates widely different methods of learning as well as very highly selected groups of students. An inspection of the scatter-diagrams has shown that the lack of perfect correlation is not due to any particular grade of student, but to wide fluctuations among all grades. It is hoped that a further study of learning methods among students will throw some light on such retention figures.

These correlations may be compared with correlations found by Gates,[5] Jones,[6] Lee,[7] and Johnson.[8] Gates reports a coefficient of .82 ± .03 for the recall of sense material studied for nine minutes, recited immediately, and then recited again after an interval of three hours. Jones reports a mean coefficient of .57 ± .12 for material heard in one lecture period which was tested immediately and then again after an interval of from two to eight weeks. Lee reports a correlation of .40 ± .04 on recognition test scores given thirty seconds and twenty-four hours after a fifty second impression period for twenty-five familiar words. Johnson in a study of retention of college botany finds correlations of .754 ± .048 and .84 ± .04 between final examination scores and retests (twenty-four and thirty-six students respectively). He used part of the same examination three months later. These figures are like the coefficients found for zoology, but much higher than those for psychology and physiological

[5] Gates, S. E. "Correlations of Immediate and Delayed Recall," *Journal of Educational Psychology*, IX (1918), pp. 489-496.

[6] Jones, H. E. "Experimental Studies in College Teaching," *Archives of Psychology*, 1922, p. 68.

[7] Lee, Ang. Laufen. "An Experimental Study of Retention and its Relation to Intelligence," New York: Columbia University, 1923.

[8] Johnson, P. O. "Permanence of Learning in Elementary Botany." *Journal of Educational Psychology*, XXI, pp. 37-48.

chemistry. The reason for these discrepancies is not apparent, but it may be that a laboratory course results in more consistent retention than a lecture course.

These studies indicate that there will probably be higher correlations with shorter time intervals, with more meaningful material, and with more uniform methods of learning.

3. *Comparison with Studies Made by Others.*—Studies of retention may be grouped into four general classes according to the type of material: (1) nonsense material, (2) tool subjects of wide general application, (3) specific meaningful material, and (4) motor patterns. The enormous difficulty of controlling the factors involved in retention has resulted in many different standards of learning, retention, and an accumulation of results which are not comparable in any very accurate sense. The most widely used standard of retention is the proportion of retained members, and the next most common is the "saving" method. The saving method is not considered in this study, but it would form a valuable addition to our knowledge of retention. Diagrams 2, 3, 4, and 5 show the proportion of retained members for adults and children.

Diagram 2 compares the present study with Austin,[9] Jones,[10] and Ebbinghaus.[11] Austin had mature adults read over technical passages five times, using distributed and undistributed repetitions. She measured retention after two and four weeks and found that the unspaced repetitions were nearly as effective as the spaced on the immediate tests, but markedly inferior after the longer periods. Jones gave completion tests to measure the results of 40 minute lectures in elementary psychology. He found a fairly smooth logarithmic curve with about 24 percent retained after eight weeks. Ebbinghaus, using lists of nonsense syllables, found a very rapid drop which left about twenty percent retention after two weeks, but Radossawljewitsh,[12] using nonsense syllables, found somewhat better retention after two weeks. All of these curves show that the zoology and psychology material has been considerably better retained

[9] Austin, S. D. McK. "A Study of Logical Memory," *American Journal of Psychology*, XXXII (1921), pp. 370-403.

[10] Jones, H. E. "Experimental Studies in College Teaching," *Archives of Psychology*, 1922, p. 68.

[11] Ebbinghaus, H. *Memory Training.* Translated by H. A. Ruger and C. E. Bussenius. (Leipsig, 1885), New York: Teachers College, Columbia University, Reprint, pp. 76-79.

[12] Radossawljewitsh, P. R. Das Behalten und Vergessen bei Kindern und Erwachsenen nach experimentellen Untersuchungen. Leipsig, 1907.

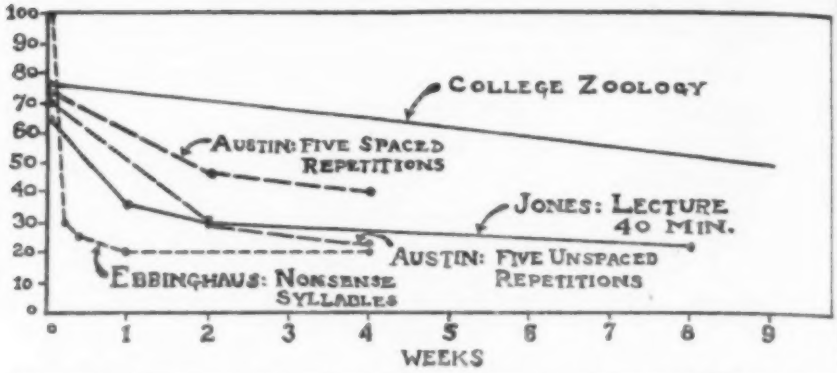

DIAGRAM 2. RETENTION OF INFORMATION IN ADULTS: COMPARISON OF RECORDS GIVEN BY JONES, AUSTIN, AND EBBINGHAUS, WITH PRESENT STUDY

Average Percent Correct of Total Possible Score

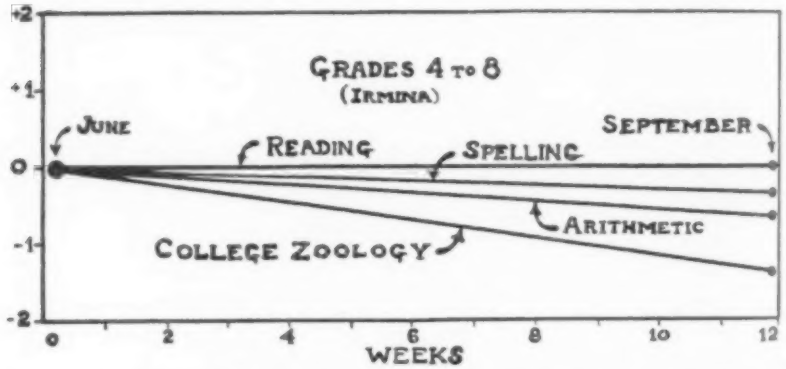

DIAGRAM 3. RETENTION OF TOOL SUBJECTS BY ELEMENTARY SCHOOL STUDENTS: COMPARISON OF DATA GIVEN BY IRMINA WITH THE PRESENT STUDY

Average Changes Shown in Sigma Scores

than the material reported by these investigators. This probably indicates that college students do a certain amount of overlearning, where the material is presented and recited several times in the course of a semester.

Diagram 3 compares the present study with measures of retention of elementary subjects in Grades 2 to 7 by Irmina.[13] Her results are typical

[13] Irmina Sister M. "The Effects of Summer Vacation upon the Retention of the Elementary School Subjects," *Educational Research Bulletin*, (Catholic University of America), III (1928), Numbers 3 and 4.

of those given by Noonan,[14] Morrison,[15] Woody,[16] Kirby,[17] and others. It is shown that the reading test scores show no reliable change over the summer, while spelling and arithmetic scores tend to decrease slightly in the case of combinations which are not commonly used. From a different angle it is found that from 30 to 95 percent of elementary students show gains during the summer vacation and that these gains correspond somewhat to gains in general mental ability. We must probably infer that the better retention of elementary school subjects shown in Diagram 6 is due to maturation of mental ability, greater overlearning, and more recitation or use during the summer.

Diagram 4 compares the present study with that of Bassett[18] where

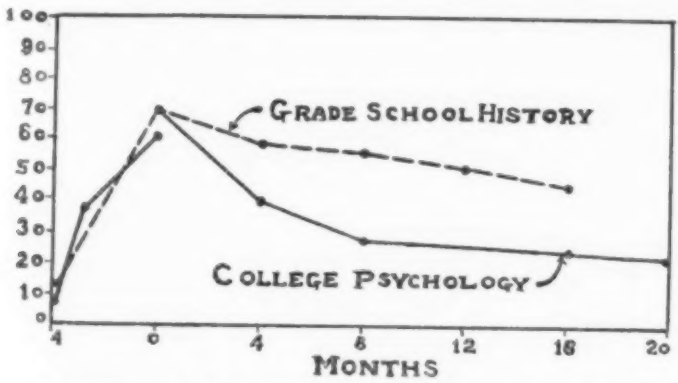

DIAGRAM 4. RETENTION OF HISTORY BY GRADE SCHOOL CHILDREN AFTER BASSETT COMPARED TO RETENTION OF COLLEGE PSYCHOLOGY

Average Percent Correct of Total Possible Score

[14] Noonan, M. E. *Influence of Summer Vacation on the Abilities of Fifth and Sixth Grade Children.* (New York: Teachers College, Columbia University, 1926), Contributions to Education, No. 204.

[15] Morrison, J. C. "What Effect Has the Summer Vacation on Children's Learning and Ability to Learn?" *Educational Research Bulletin,* (Ohio State University), III (1924), pp. 245-249.

[16] Woody, Clifford. "Permanent Effects of the Teaching of Spelling," (Ann Arbor: Bureau of Educational Reference and Research, University of Michigan, 1924), Bulletin No. 71.

[17] Kirby, T. J. *Practice in the Case of School Children.* (New York: Teachers College, Columbia University, 1913), Contributions to Education.

[18] Bassett, S. J. "Retention of History in the Sixth, Seventh, and Eighth Grades, with Special Reference to the Factors that Influence Retention," *Journal of Educational Psychology,* XX (1929), pp. 683-691. See especially Table VI.

the amounts of American History retained by grades 6, 7, and 8 are reported. She used fairly reliable 82 point itemized tests, and had approximately 1100 students for the retest after four months, 900 for the eight months interval, 350 for the twelve month interval, and 138 for the sixteen month interval. The preliminary and final examinations in history show nearly the same degree of success as those in psychology indicating that the tests were of similar relative difficulty. The curve of forgetting is slower for the grade pupils than the college students, but both curves are very similar in shape. Her study differed from the present one in that the same students were used throughout the series on the same tests, so that there may have been some practice effect. It is highly probable that the elimination of the poorer students before the retests was more effective in college than in the grades, Table II. There is also a probability that the grade scholars received more subsequent training in their school and home environment before the retests than the college students.

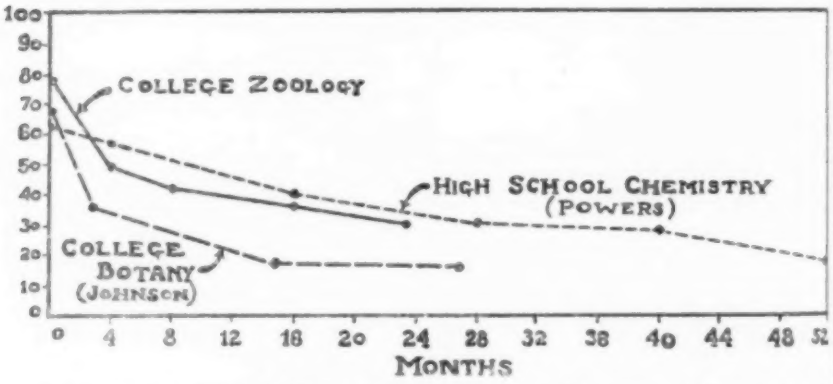

DIAGRAM 5. RETENTION OF HIGH SCHOOL CHEMISTRY COMPARED TO RETENTION OF COLLEGE BOTANY AND ZOOLOGY
Average Percent of Total Possible Score

Diagram 5 compares the present study with those of Powers[19] and Johnson.[20] Powers measured the retention of high-school chemistry by

[19] Powers, S. R. *A Diagnostic Study of the Subject Matter of High School Chemistry.* (New York: Teachers College, Columbia University, 1924), Contributions to Education, No. 149, pp. 49-54.

[20] Johnson, P. O. "Permanence of Learning in Elementary Botany," *Journal of Educational Psychology,* XXI, pp. 37-48.

testing students entering college courses in chemistry, and Johnson measured the retention of an elementary college course in botany by retesting students entering advanced courses. In the selection of students, type of test, procedure, and results these studies are strikingly similar to those made at Michigan. The more rapid loss of college information may be due to proficiency by college students in the fine art of cramming, but the proof for this hypothesis is lacking.

In the field of motor training, Swift[21] found that there was a marked retention of the habit of juggling two balls with the right hand after six years without practice. The results are given in terms of the amount to time saved in relearning, so they are not comparable with this study. It is generally conceded that the simpler forms of motor habits when thoroughly practiced are retained for long periods.

With regard to the general shape of the curves given in all of the diagrams, it is fairly clear that there is a period of rapid forgetting followed by a period of slower forgetting. The small number of cases involved and the large number of unknown factors make it unreasonable to try to predict a law of forgetting, as shown by Bean,[22] Ebbinghaus,[23] and others, but it seems highly probable that under more controlled conditions prediction formula would be found to be very reliable for such material.

---

[21] Swift, E. G. "Relearning a Skillful Act: An Experimental Study in Memo-Muscular Memory," *Psychological Bulletin*, VII (1910), pp. 17-18.

[22] Bean, C. H. "Curve of Forgetting," *Archives of Psychology*, 1911, No. 21.

[23] Ebbinghaus, H. *Memory Training*. Translated by H. A. Ruger and C. E. Bussenius. (Leipsig, 1885), New York: Teachers College, Columbia University, Reprint, pp. 76-79.

EARLY SCHOOL SUPERINTENDENTS IN NEW ORLEANS

STUART G. NOBLE
Tulane University of Louisiana

1771

"I, Don Manuel Andres Lopez de Armesto, as Director, to whom the other three are to be subordinate, shall prescribe for them the method and rules for literary exercises, and piety; shall watch over the progress of the pupils, conduct of the teachers, and supply their vacancies in case of sickness or any other unforeseen accident; so that the movement may maintain the good order of this great important work; and my salary and remuneration shall be a thousand pesos yearly paid the same as each of the others mentioned."[1]

So reads the contract between His Majesty, Charles III of Spain, and the aforesaid Don Manuel Andres Lopez de Armesto, first superintendent of a school system in America! The circumstances were these: The Spanish monarch, doubtless upon the advice of General Alexandro O'Reilly, who had formerly served as governor of Louisiana, resolved to establish schools in the province, and, forthwith translating the resolution into action, he sent out three teachers and the "director." The contracts with the teachers were signed and sealed before their departure from Spain. The resident governor of the colony was, at the same time, commanded to provide suitable school houses and lecture halls and to pay the salaries of the teachers in accordance with their contracts. The four teachers arrived in New Orleans in 1772. The French population, however, did not take kindly to the idea of sending their children to receive instruction in Spanish, Latin, and religion from Spanish teachers, and Governor Luis de Unzaga found difficulty in securing patronage requisite to the operation of the schools.[2] Nevertheless, at least one primary school was established, which maintained a feverish existence until 1803, when Louisiana passed under the control of the American Commonwealth.[3]

That New Orleans should furnish the first example of a school superintendency within the present limits of the United States is scarcely less

[1] "Document Relating to the Establishment of Schools in Louisiana, 1771." Translated and edited by David K. Bjork. *Mississippi Valley Historical Review*, XI, pp. 561-569.

[2] Gayarré, Charles. *History of Louisiana: The Spanish Domination* (third edition), II, p. 204.

[3] American State Papers, Documents Legislative and Executive of U. S. Congress, Vol. I, p. 353.

to be marvelled at than the fact that the Spanish colonial government should be interested in establishing in Louisiana under lay leadership, and largely for secular purposes, a system of public schools. Armesto's claim to the distinction of being the first school superintendent rests upon the following evidence:

(1) The functions outlined in the director's contract were essentially supervisory. He was to prescribe the "methods and rules for literary exercises and piety"; "watch over the progress of pupils, conduct of teachers, and supply their vacancies in case of sickness or any other unforeseen accident."

(2) No teaching duties were prescribed for the director. The duties of supervision were supposed to be numerous enough to occupy his full time.

(3) Although certain of the director's duties might nowadays be delegated to a principal rather than to a superintendent, the fact that several schools, on both the secondary and the primary levels, were contemplated, and that his jurisdiction was to extend over all of them, seems to draw more sharply the analogy of his position to that of the superintendent.

(4) It is true that the director was not charged with the financial management of the schools, but it is also true that the financial responsibility is but one of a superintendent's obligations.[4]

(5) Although the King's plans went awry and only one school seems to have been established, the meager evidence in hand indicates that the director actually, for at least 28 years, exercised the functions of his contract.[5]

Taking these facts into consideration we may say with confidence that Don Manuel Andres Lopez de Armesto, though called director, was commissioned school superintendent in 1771, and actually performed the

[4] Recent writers who have challenged the claims of Buffalo and Louisville to the first superintendency have done so on the ground that the early duties prescribed for the chief school officer in those cities were largely financial. Reisner, Edward H. *The Evolution of the Common School*, (New York: Macmillan Company, 1930), p. 357. Knight, Edgar W. *Education in the United States* (Boston: Ginn & Co., 1929), p. 304.

[5] The same Armesto or another of that name, was still in office as "Director of the Royal Schools" as late as 1800. A recently published document shows that on July 23, 1800, Armesto examined and recommended for license a French teacher of the name of LeFort. The license was granted by the Governor on condition that Armesto be permitted to supervise LeFort's school. Dart, H. P. "Public Education in New Orleans in 1800," *Louisiana Historical Quarterly*, 1928, p. 246. Also Gayarré, *op. cit.*, p. 205.

duties of such an office in New Orleans for an undetermined period in, and after, 1772.

1826

The Legislature of the State of Louisiana on March 31, 1826, authorized the establishment in New Orleans of two primary schools and a central (higher) school.[6] These institutions were to be governed by a board of ten regents who were to select and place at the head of the system "an American citizen and learned in the English, French, and Latin languages, mathematics and literature." To this director the regents were authorized to delegate their power to supervise the primary schools and to examine and promote students to the central school. The act made ample provision for teachers in schools of both the elementary and secondary levels; it did not specify that the director should teach.

The schools were opened, according to the law, the year they were authorized. The name of the first superintendent seems to have been lost, but four years later (1830), we find J. S. Moreau serving in this capacity.[7] The board of regents, in 1836, was empowered by the state law to elect the director for a term of three years. The same law also authorized this officer to recommend a list of candidates from which the principals and assistant teachers of all schools should be chosen.[8]

In the provision for schools in New Orleans in 1826, we have not only one of the first examples, if not *the* first, of an American city school board. In this provision, also, we have the schools of the city placed under the supervision of a director, who, in this instance, proves to be the first city superintendent serving an American municipality.[9]

The facts speak for themselves. No argument is required to show that duties performed by this officer were essentially those of a city superintendent. In all but name, this New Orleans school officer was a superintendent.

---

[6] An Act Establishing Two Primary Schools and One Central School, March 31, 1826.

[7] Payne, William A. *Studies Relating to Free Public Education in New Orleans Prior to the Civil War.* An unpublished thesis of Tulane University, 1930, page 6. Moreau seems to have held this post, possibly without interruption, until 1841. *Journal of the First Municipality,* June 7, 1841, pp. 43-44.

[8] *Op. cit.*

[9] This statement implies that the director of the schools in 1772 served the Spanish City of New Orleans.

The coincidence of the use of the term, *director*, employed by the Spaniards in 1771, and here again, fifty-five years later, by an Anglo-American legislative assembly, to designate the chief school officer, may well cause the careful student to pause a moment for reflection. Is there any connection between the two cases? The early Spanish schools lingered on until 1803, leaving only scanty records of their operations. After that date, the American Territorial Government initiated the movement for a state school system. Research among the meager materials of the period, however, fails to reveal any Spanish influence upon Anglo-American schools.

1841

At the meeting of the board of directors of the public schools of the second Municipality, (Anglo-American quarter), November 6, 1841, the president of the board was authorized by resolution to "contract with John A. Shaw, Esq., of Bridgewater, State of Massachusetts . . . as principal of the schools of this municipality till August 1, 1842, on the terms and conditions contained in the letter of Horace Mann, Esq., . . . and that the president request Mr. Shaw to visit the public schools of New York and Philadelphia."[10] This officer's salary was to be $2,500 a year. Although the title of "principal" was used in this document, the duties of the position, according to the minutes of subsequent board meetings, were essentially administrative.[11]

Professor Shaw is generally reputed to be the first city superintendent to exercise the duties of the office in New Orleans. Practically all writers of school history refer to the establishment of the office in that city in the year 1841.[12] In this connection it is interesting to note that at this time, there were three separate and distinct school systems in New Orleans, one for each "municipality," and that Shaw's jurisdiction extended over only one, that of the Anglo-American quarter, or Second Municipality! During a part of his administration, which lasted several years, the French quarter, or First Municipality, had its own superintendent. Thus, while Shaw undoubtedly performed the duties of a superintendent, he served only a portion of the city. His jurisdiction was not so inclusive as that of his predecessors of 1771 and 1826.

---

[10] School Board Minutes, Second Municipality, Nov. 6, 1841, pp. 7-8.

[11] Payne. *op. cit.*, p. 42 ff.

[12] *Cyclopedia of Education*, for example.

THE ORIGIN OF THE IDEA

From what source have we derived the idea of the city superintendency? It is the purpose of this brief study merely to bring into prominence the heretofore neglected, or unknown, items of history previously alluded to, and not to present an exhaustive treatise on the origin of the city superintendency. In this connection, however, the writer cannot refrain from contributing the results of his limited study of the topic.

The origin of this office, in common with that of many familiar school practices, is obscure. Dr. Suzzallo, in an able monograph[13] written some years ago, undertook to show the evolution of local school supervision in Massachusetts, but his study did not account for, nor did it claim to account for, the simultaneous development of city school supervision in centers far removed from Massachusetts. It is interesting to note in his study that local committees in Massachusetts in the last decade of the 18th century were empowered to "superintend" the schools. It is also interesting to note that in 1826, the very year New Orleans established the office, the Massachusetts Legislature passed a law which made possible, some years later, the delegation of the supervisory functions of a school committee to a superintendent.[14]

Considering the vogue of German educational practices in America from 1820 to 1850, one might readily attribute the origin of the city superintendency to German sources, but there seems to be no foundation for such a supposition. There remains to be considered the possibility that the idea was borrowed from France. The Louisiana Law of 1826, establishing two primary schools and a central school in New Orleans, and providing for their supervision by a director, in the terms employed, shows unmistakably the influence of French laws passed in 1795.[15] These earlier laws provided for *ecoles primaires* and *ecoles centrales* for France.

The presence of Lakanal, joint author of these acts, as school principal in New Orleans just prior to the enactment of the Louisiana Law of 1826, lends color to the hypothesis that the European influence was present in the planning of the latter act. Did the French laws contemplate the

---

[13] Suzzallo, Henry. *The Rise of Local School Supervision in Massachusetts.* New York: Columbia University, 1907.

[14] *Ibid.*, p. 146.

[15] Recueil de lois et Réglemens concernant L'instruction Publique depuis L'edit de Henri IV, en 1598 jus 'a ce jour, Vol. I, Paris, 1814, pp. 37-41; 46-49.

supervision of city schools by a director? A careful scanning of them fails to reveal any supervisory officer either by that name or another, nor does subsequent French legislation mention any such officer. Already we have pointed to the lack of evidence indicating a Spanish origin of the idea. We are therefore driven to the conclusion that the Law of 1826 provided the innovation of the director. We may conclude further, that the city superintendency *seems* to be indigenous to America.

THE SIGNIFICANCE OF THE INSTANCES

Priority, apart from leadership, means little. A precedent may be inherently important, but its prestige increases in proportion to the spread of the idea. In the case of the superintendency, there is no doubt of the importance of the idea, or of the spread. Buffalo established the office in 1837; Louisville, Lexington, and Maysville, Kentucky, and Providence, R. I., in 1838; St. Louis in 1839; and Springfield, Massachusetts, in 1840. By 1870, there were over twenty-seven city superintendencies, and by 1885, practically every city in the Union had established the office. The undetermined factor in the present instance is the original source from which the contagion spread. No one has yet found out whether the idea first emanated from New Orleans, from Buffalo, from Louisville, from Springfield, or from several of these centers simultaneously. Although the writer has observed the coincidence of the establishment in the Mississippi valley of several superintendencies before 1840, he is unable to say that the cities of this region were following the leadership of New Orleans.[16] The claim of the Louisiana city to priority in the establishment of the superintendency seems to be incontestable. Its claims to leadership, not very clear as yet, are still as good as that of any other city.

[16] During the period, there was as much river traffic in ideas as in material commodities. Vincennes University, for instance, copied the legal machinery of the University of the Territory of Orleans. Noble, Stuart G. "Governor Claiborne and the Public School System of the Territory of Orleans," *Louisiana Historical Quarterly*, 1929.

FACTORS WHICH DETERMINE THE EFFECTIVENESS OF WEIGHTING

DOUGLAS E. SCATES
Director of Research, Cincinnati Public Schools
and
FOREST R. NOFFSINGER
Indiana University

A number of studies of weighting test scores have been reported at different times and have been in general agreement that weighting is much less effective than would be supposed. One hesitates to accept the implication that weighting is futile, for he can readily set up hypothetical cases in which it is important. From an analysis of data reported herewith it appears that the effectiveness of weighting is dependent upon three factors which form the subject for this paper.

The data with which this discussion is illustrated are test scores made by candidates in the Indiana Edison contest of last summer. The contest afforded scores on six tests taken by eighty boys, and on ten tests taken by twenty-six boys. The effect of weighting can be studied by noting the changes produced in the total scores when the weights of the constituent series are changed. In the present case four different sets of weights were applied successively to the test scores and the four resulting series of total scores were compared by means of correlation.

Since the weight of a series is given by its variability, series which have not been artificially weighted may be said to have a *natural weight* corresponding to their respective standard deviations. Thus in Table I,

TABLE I

FOUR SETS OF WEIGHTS APPLIED EXPERIMENTALLY TO SCORES ON SIX TESTS

Test	S.D.	Natural Weighting	Equal Weighting	Committee Weighting	Contest Weighting
General Science	10.8	0.8	1.2	1.0	0.9
Intelligence	9.8	0.7	1.2	1.0	0.8
Mathematics	13.3	1.0	1.2	1.0	1.1
General Information	14.8	1.1	1.2	0.5	0.6
Physics	27.2	2.1	1.2	2.0	2.2
Chemistry	21.7	1.6	1.2	2.0	1.8
Total of Weights		7.3	7.2	7.5	7.4
Coefficient of Variation		39	0	45	47

the weights in the column headed "Natural Weighting" are in the same proportion as the standard deviations of the six series. Total scores for the tests naturally weighted were obtained by adding the original scores of each pupil on the six tests. In the column headed "Equal Weighting"

are given the weights when each of the six series of test scores was multiplied by a number that would make the standard deviations of all the series equal. The weights given in the column headed "Committee Weighting" represent the judgment of the committee. The weights given in the last column are those used in the contest. These are merely approximations to the committee weights. These four systems of weights were applied successively to the scores made on the six tests, resulting in four different series of total scores.

Correlations were calculated between these four series of total scores representing the four different sets of weights, the results of which are given in Table II. If these values were rounded to two places, the rank correlations would, with one exception, be 1.00, while two of the product-moment coefficients would be .99 and two others .98. These high correlations indicate that the four sets of weights (Table I) produced negligible differences in the total scores. It is of interest to analyze the situation to see what factors will account for these results.

In analyzing these results it is obvious that any two sets of weights must differ if they are to produce different results. This difference between sets of weights has two aspects: (1) the weights in at least one set must vary among themselves (if all the weights in each set were equal, there would, of course, be no difference in the effect of applying one set rather than the other); and (2) the corresponding weights in different sets must differ. We shall discuss the first situation first.

TABLE II

CORRELATIONS BETWEEN FOUR SERIES OF TOTAL SCORES FORMED BY APPLYING FOUR DIFFERENT SETS OF WEIGHTS TO SIX SERIES OF TEST SCORES (N = 80)

Weightings Applied to Test Scores to Form Total Scores Which Were Correlated	Rank Correlation	Product-Moment Correlation
Natural, Equal	.9985	.981
Natural, Committee	.9991	.982
Natural, Contest	.993	.987
Equal, Committee	.998	.971
Equal, Contest	.997	.962*
Committee, Contest	.9998	.989

* This coefficient being lower than the others, the table was checked for linearity. The two etas are .969 and .966 tending to confirm the value observed.

The term *vigor* of the weights is used by the authors to designate the difference among the weights of any set. It can appropriately be measured by the coefficient of variation,[1] which reflects relative rather

[1] This is Pearson's measure, $V = 100\sqrt{\Sigma(x/M)^2/N} = 100\sigma/M$.

than absolute variability. This value is given for each of the four sets of weights at the bottom of Table I. In order to judge the vigor of these weights, one needs to set up standards. It is known, for example, that the coefficient of variation for two weights having a one to one correspondence is zero. A list of such ratios might be set up as follows: 1 : 1, 0; 1.5 : 1, 20; 2 : 1, 33; 3 : 1, 50; 4 : 1, 60; 5 : 1, 67; 10 : 1, 82. Further, a set of six weights having the proportion of 1 : 2 : 3 : 4 : 5 : 6 has a V value of 49, and another set of six weights with proportions 1 : 5 : 10 : 50 : 100 : 500 gives V = 159. This last set is decidedly vigorous. Tentatively we may, therefore, say that a set of weights with a V (coefficient of variation) value below 25 is mild, and that a V of 75 or over is strong. Since the four sets of weights used have V's of 39, 0, 45, and 47, it would appear thus that three of them were at least moderately strong. The high correlations between the several series cannot, therefore, be accounted for on the basis of lack of strength in the sets of weights.

The second requirement for differences in weights is that the corresponding weights in the different sets must differ; that is, there should be a low correlation. It is clear that if there were a perfect correlation between different sets of weights, they would produce identical results, regardless of their vigor. Correlations (product-moment) between the four sets of weights (Table I) are as follows: Natural, Committee: .82; Natural, Contest: .93; Committee, Contest: .96.[2] While definite standards are not available, it would appear that these correlations between the sets of weights were sufficiently high to be a significant factor in reducing the effect of the weights and therefore in producing the high correlations recorded in Table II.

There is yet other evidence of the importance of this factor of correspondence. While we cannot correlate the set of "Equal Weights" (Table I) with the others, since the correlation is indeterminate, we may resort to another method of measuring the amount of correspondence in the different sets of weights. The absolute differences between the corresponding weights of different sets, when the sets are equated with regard to means, may be taken to represent a lack of correspondence. For example, a comparison of the set of natural weights and the set of equal weights (Table I) give horizontal differences of .4, .5, .2, .1, .9, and .4, a

[2] Probably one would not knowingly set up two series of weights that agreed so closely. The precise values of the contest weights were not known at the time they were used.

total of 2.5. The totals for other possible pairs in Table I give the following values: Natural, Equal: 2.5; Natural, Committee: 1.6; Natural, Contest: 1.1; Equal, Committee: 2.9; Equal, Contest: 3.0; Committee, Contest: 0.9.

These values represent a lack of correspondence as given, but may be changed into an index of correspondence by subtracting them from any constant. If so subtracted, they will be found to be in the same order as the product-moment correlations in Table II. This appears to be definite evidence that this factor of correspondence in the weights of different sets is important. It is effective in the present situation in spite of the fact that there is not a great diversity in the degrees of correspondence noted for the different sets of weights.

A third factor which contributed materially to the high correlations observed between the different series of total scores is the general intercorrelation between the scores made by pupils on the various tests. If two series correlate perfectly, no sets of weights, no matter how vigorous nor how little the correspondence between them, would produce different results. In the case of several series, the critical correlation is that secured between each series and the sum of the other series. If this correlation is perfect for any series, the addition of this series can have no effect on the order of totals, and this is true irrespective of any conceivable weight the series might be given. Only when the correlations between each series and the sum of the remaining series are zero do the weights in any set actually operate at their face value. The correlation between each of the series of test scores in turn with the sum of the remaining series (natural weighting) is, by straightforward calculation: General Science, .63; Intelligence, .57; Mathematics, .61; General Information, .40; Physics or Chemistry, .61. These correlations reduce the effectiveness of any set of weights that may be applied to the several series, since differences in weights can affect only that portion of a trait that is independent of the other traits.

From the above line of reasoning it can be seen that weights cannot be taken at their face value; the effectiveness of weights will vary according to some inverse function of the correlation between traits. Thus, when we have made the variability of series equal, we have secured only a surface equality. It would seem, therefore, that Kelley's recommendation to weight more heavily those traits which are more independent[3] is

[3] Kelley, Truman L. *Interpretation of Educational Measurements.* (1927), pp. 66-71.

unwarranted, since these traits automatically exert a greater influence, and to augment their weight through increasing their standard deviation is to weight the element of independence doubly. In fact, it seems probable that we should really like to equalize the *effective* weight of each series just as we now equalize the apparent weight through equating standard deviations. When this is achieved, it is possible that a weight for independence would be desirable, although this is not entirely clear if we assume that a weight for pedagogical importance is properly made.

Further evidence of the influence of these three factors—vigor of weights, correspondence of weights, and intercorrelation of traits—may be secured by noting their effect on the composite of ten tests. These ten series of test scores were subjected to four sets of weights similar to those previously discussed, except that in this case each set of weights contained ten values. The weights are shown in Table III. Four series of

TABLE III

FOUR SETS OF WEIGHTS APPLIED EXPERIMENTALLY TO SCORES ON TEN TESTS

Test	S.D.	Natural Weighting	Equal Weighting	Committee Weighting	Contest Weighting
General Science	7.7	1.0	2.0	2.0	2.1
Mathematics	8.4	1.1	2.0	4.0	2.1
Biology	17.5	2.4	2.0	0.0	1.1
English	10.8	1.4	2.0	1.0	2.1
General Information	13.3	1.8	2.0	1.0	2.1
Intelligence, (1)	8.2	1.1	2.0	2.0	2.1
Intelligence, (2)	14.6	2.0	2.0	2.0	2.1
Physics, (1)	15.9	2.1	2.0	2.0	2.1
Physics, (2)	10.2	1.4	2.0	2.0	2.1
Chemistry	42.9	5.8	2.0	4.0	2.1
Total of Weights		20.1	20.0	20.0	20.0
Coefficient of Variation		68	0	59	0.2

total scores were constructed by applying successively the four sets of weights to the series of test scores, and the intercorrelations of these total scores calculated, as before. These correlations appear in Table IV. By comparing these correlations with the corresponding ones in Table II it will be noted that the later ones are somewhat lower. It will be interesting to see whether this can be accounted for in terms of the factors which have been discussed.

When the four sets of weights in Table III are studied with regard to the first factor, vigor of weights, it is seen that they are, on the average, about the same as those in Table I, though there is more unevenness in the later group. This can be seen by comparing the coefficients of variation given in the two tables. With regard to correspondence of weights, the four sets used on the ten tests are decidedly less in agreement than were the four sets of weights used on the six tests. This fact should make

weights of equal vigor more effective and should reduce the correlations between resulting total scores. The correlations between the sets of weights are given below:

	Ten tests	Six tests
Natural, Committee	.37	.82
Natural, Contest	—.05	.93
Committee, Contest	.57	.96

The method of summation of absolute differences in corresponding weights gives the following difference totals: 8.5, 10.9, 9.9, 8.0, 1.8, 7.5. These are, on the average, four times as great as were the differences in weights used on the first six tests; whereas we should expect them to be about twice as great due to the increase in the number of tests. This lack of correspondence in weights seems sufficient to account for the lower correlations in Table IV. The correlation of each test with the sum of the other nine tests was not calculated.

TABLE IV

CORRELATIONS BETWEEN FOUR SERIES OF TOTAL SCORES FORMED BY WEIGHTING THE SCORES ON TEN TESTS IN FOUR DIFFERENT WAYS ($N = 26$)

Weightings Applied to Test Scores to Form Total Scores Which Were Correlated	Rank Correlation	Product-Moment Correlation
Natural, Equal	.975	.943
Natural, Committee	.975	.961
Natural, Contest	.977	.951
Equal, Committee	.975	.950
Equal, Contest	.996	.985
Committee, Contest	.977	.951

SUMMARY

Three factors have been discussed which it is believed largely determine the limit of effectiveness of weighting. These are lack of vigor within a set of weights, correlation between the weights of different sets, and correlation (lack of uniqueness) among the traits weighted. If the set of weights is vigorous—that is, has a large coefficient of variation—it is potentially an effective set of weights. If the weight for each series differs markedly from the natural weight of that series, the substitution of the new weights may produce a marked effect. But weights act effectively only on that part of a trait which is unique in comparison with the total of the other traits. A set of weights with any degree of vigor and no correlation with the existing weights may be rendered inconsequential by virtue of high intercorrelation between the traits to which the weights are applied.

A STATISTICAL STUDY OF A NEW TYPE OF OBJECTIVE EXAMINATION QUESTION

GRACE HOLMES and EDNA HEIDBREDER
University of Minnesota

THE present study was undertaken to determine the reliability and validity of the Wrong-Word type of objective examination question. The Wrong-Word type of question is an adaptation of the kind of item used in the Chapman-Cook Speed of Reading Test. The following directions were used:

In each of the following sentences pick out the one word that makes the sentence wrong and write it in the space on the left. The wrong word is never one of the first three words in the sentence. For example:
hearing Spectacles are commonly used to improve the hearing.

A few samples of the items used in the examination are given below. The correct answers are given in parentheses.

(*native*) Habits are probably the most important native factors of advantage in attention in adults.

(*cerebellum*) The pyramidal tract is a bundle of fibers extending from the higher motor centers in the cerebellum to the lower motor centers in the cord.

(*afferent*) The autonomic nervous system, which is afferent in function, is a relatively independent system.

The chief advantage of this kind of material is its flexibility. Any kind of sentence structure, simple or complex, can be used. Facts which do not readily lend themselves to formulation as analogies, single choice, and matching questions can usually be put into the form of Wrong-Word items. As compared with completion questions, which are also flexible in form, they have the advantage of objectivity in scoring. In completion questions, it is sometimes necessary to decide by subjective judgment whether a particular answer, different from that given in the key, is to be considered correct. It seemed worth while, therefore, to determine by statistical analysis the suitability of this kind of item for use in objective examinations.

PROCEDURE

Thirty-four questions of the Wrong-Word sort were included in the fall quarter final examination in Psychology 1 at the University of Minnesota in December, 1929. This was a two-hour objective examination, and

was taken by 938 students. In addition to the 34 Wrong-Word items, the final examination included three of the more familiar types of objective questions. There were 83 Single Choice items, 44 Analogies, and a matching test consisting of 20 pairs. There were, therefore, 181 items in the entire final examination.

Other data available for use in this study were:

(1) The mid-quarter examination in the course. This consisted of 80 objective questions, 30 Single Choice items, 20 Analogies, and 20 Completion items.

(2) The weekly quizzes in the course. There were nine ten-minute quizzes given during the quarter. Each consisted of two or three short questions of the essay type. The quizzes were scored by graduate assistants from keys prepared by the instructors. The scores were distributed on a five-point scale: 0, 1, 2, 3, 4.

(3) The final marks in the course. The averages of the weekly quizzes were converted into sigma scores, as were the scores on the mid-quarter examination and on the final examination. The combined sigma score determined the final grade in the course. The grades were distributed as follows: A, 10 percent; B, 17 percent; C, 44 percent; D, 17 percent; F, 10 percent.

All of the data used in the present study were secured from the records of the Department of Psychology.

RESULTS

Statistical analysis brought out the following facts about the Wrong-Word questions:

1. The scores on this part of the examination conform closely to the normal frequency curve. The Wrong-Word items may be said to have given an adequate distribution of the group, since neither zero scores nor perfect scores occurred. There were three students who made scores of six or seven, and five students who made scores of thirty-two or thirty-three out of a possible thirty-four. These facts indicate that this part of the examination was not completely beyond the abilities of the poorest students nor completely within the abilities of even the best students.

2. The Wrong-Word items gave consistent and statistically valid differences in central tendency in distinguishing A, B, C, D, and F students. The evidence on this point is given in Table I.

Table I gives the means and standard deviations of each of the A, B, C, D, and F groups of students on each of the four types of objective

TABLE I

MEANS AND STANDARD DEVIATIONS OF THE SCORES OF A, B, C, D, AND F STUDENTS ON EACH TYPE OF OBJECTIVE QUESTION

	Wrong Word		Matching		Single Choice		Analogies	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
A	27.3	3.0	15.9	1.9	61.2	6.5	33.3	4.5
B	24.4	2.9	15.0	2.3	54.1	5.6	27.8	4.1
C	20.8	3.1	13.0	2.6	48.1	6.0	23.1	4.2
D	17.5	3.2	11.5	2.7	42.3	5.8	20.0	3.9
F	14.9	3.2	9.5	3.1	43.3	5.7	16.7	3.8

questions. For each type, there is a consistent decrease in the mean score from the A to the F groups, with a single exception. The difference between the averages of the D and F students on Single Choice is in favor of the F students. This difference is very small, however, and within the probable error of the mean. With this single exception, all of the differences between the means of adjacent groups were statistically significant, ranging from five to twenty times their probable errors. The indices expressing the reliability of the differences between the means of the groups on the Wrong-Word items are larger, on the average, than those for any of the other types.[1]

3. The Wrong-Word items gave adequate correlations with the available criteria.

TABLE II

CORRELATIONS BETWEEN THE MEASURES INCLUDED IN THE STUDY

	r	P.E.r
Wrong-Word and Final Exam Minus Wrong Word	.74	.009
Analogies and Final Exam Minus Analogies	.64	.012
Matching and Final Exam Minus Matching	.68	.011
Single Choice and Final Exam Minus Single Choice	.72	.010
Wrong-Word and Final Grade	.78	.007
Analogies and Final Grade	.76	.009
Matching and Final Grade	.60	.013
Single Choice and Final Grade	.81	.007
Wrong-Word and Analogies	.62	.014
Wrong-Word and Matching	.62	.013
Wrong-Word and Single Choice	.67	.012
Wrong-Word and Mid-Quarter	.75	.009
Wrong-Word and Weekly Quizzes	.75	.006

Table II lists the validity coefficients of the study. The coefficients are all statistically reliable. These coefficients also compare very favorably with others found in the field of objective examinations. Ben D. Wood,[2] in a study of the validity of new-type language tests, finds correlations with school ratings, ranging from +.57 to +.69. Paterson[3] re-

[1] The data on this point may be secured from the Department of Psychology, University of Minnesota.

[2] Wood, Ben D. *New York Experiments with New Type Modern Language Tests.* New York: Macmillan Co. 1927.

[3] Paterson, Donald. "Do New and Old Type Examinations Measure Different Mental Functions," *School and Society,* XXIV (Aug., 1926), 608.

ports an average of intercorrelations between old and new type examinations in an orientation course of +.52 and an average of intercorrelations among new type examinations of +.67.

When the score on each type of question is correlated with the combined score on the other three types, the highest relationship is found in the case of the Wrong-Word items. When correlations are made between each type and the final grade (a composite of scores on mid-quarter, final examination, and weekly quizzes) Single Choice gives the highest correlation, and Wrong-Word, second highest. It must be remembered, however, that there were 83 of the Single Choice items and only 34 of the Wrong-Word items in the final examination, and there were no Wrong-Word items in the mid-quarter examination. Since the Single Choice items entered into the final grade to a greater degree than the Wrong-Word items did, a higher relationship should be expected between Single Choice items and the final grade. When the effect of differing numbers of questions upon the size of these correlations is corrected by eliminating the score on each type from the criterion, as in the first set of correlations in Table II, the Wrong-Word items show the closest relationship.

The correlation between Wrong-Word items and Single Choice items is higher than the correlation of Wrong-Word items with either of the other two types. This relationship is to be expected, since Wrong-Word and Single Choice both correlate higher with other criteria than do the other two types.

The correlations between Wrong-Word items and the mid-quarter examination, and Wrong-Word items and averages of weekly quizzes are equal. This is rather interesting, in view of the fact that the mid-quarter was a purely objective examination while the weekly quizzes were all of the essay type. It is valuable to know, however, that Wrong-Word items give high correlations with kinds of examinations.

The fact that there is a tendency for the Wrong-Word items to give slightly higher correlations with the criteria than do the other items (with one exception in the case of Single Choice) should not be too greatly emphasized, because in half of the cases, the differences between the correlation coefficients are not statistically significant. The point to be noted is that statistical analysis shows that in validity the Wrong-Word items take high rank among the accepted forms of objective examination questions.

4. The Wrong-Word items show satisfactory reliability coefficients. Separate coefficients of reliability were computed for the Wrong-Word items on Forms A and B of the final examination. The items on these two forms were identical, but their arrangement was different. The two forms were regarded as being equivalent in value. There were 506 students who used form A; 432 who used form B. The odd-even method of finding reliability was used for both forms and the resulting correlations were corrected by the Spearman-Brown formula.

TABLE III

ODD-EVEN RELIABILITY COEFFICIENTS FOR WRONG-WORD ITEMS ON FORMS A AND B OF THE FINAL EXAMINATION

Form	Raw r	r for 34 items	r for 170 items
A	.57	.72	.87
B	.43	.60	.79

The first column of Table III gives the raw coefficients obtained by correlating the odd-numbered Wrong-Word items with the even-numbered items. It will be remembered that there were only 34 Wrong-Word items in the examination. The second column shows the estimated reliability coefficients, if the Spearman-Brown correction for a half-test is applied. If the number of Wrong-Word items were multiplied by five, that is, if the number of these questions were made approximately that of the questions in the entire examination, the estimated reliability would be that indicated by the correlations in the third column.

Reliability coefficients for the entire final examination, given in December, 1928, an examination very similar in length and content to the one used in this study, are for forms A and B, .86 and .83[4] respectively. Estimated coefficients of .87 and .79 for a Wrong-Word test five times its present length compare very favorably with the .86 and .83 found for an entire examination. That is, if there were as many items in the Wrong-Word section of the examination as there are items in the whole examination, the reliability of that part would be as great as that of the entire examination. The Wrong-Word items, it may be assumed, contribute their share to the reliability of the examination.

Even though the coefficients .72 and .60 are based on a test of only 34 items, they compare favorably with the average reliability coefficient of .69 found by Ruch[5] in a study of the reliability of one-hundred and

[4] These coefficients were secured by Mr. H. P. Longstaff, of the Department of Psychology, in connection with another problem.

[5] Ruch, G. M. *The Objective or New-Type Examination.* Chicago: Scott, Foresman & Co., 1929.

forty-nine standardized educational tests. The Wrong-Word test seems to have as high a degree of reliability as many of the other types of tests now in use in educational work.

5. An analysis of the data, item by item, indicated that nearly all of the Wrong-Word items possess discriminative value; that is, show a consistent decrease from the A to the F groups in the percentages of students passing the question. The data on this point were secured by computing for each question separately, the number of A, B, C, D, and F students passing the item.

TABLE IV

PERCENTAGES OF A, B, C, D, AND F STUDENTS PASSING WRONG-WORD ITEMS

Item	A	B	C	D	F	Diff. between percents of A and F students passing
1	93.4%	71.1%	57.6%	27.1%	20.0%	73.4%
6	59.0	43.3	21.4	13.5	2.0	58.0
11	90.2	73.3	61.9	46.9	42.0	48.2
16	78.5	56.7	40.5 *	40.6	40.0	38.5
21	100.0	100.0	91.9	84.4	66.0	34.0
26	54.1	52.2	40.9	33.3	26.0	28.1
31	95.1	93.3 *	94.6	88.5	76.0	19.1

The complete data on this point are not presented, but Table IV gives a sampling of the results obtained and will indicate the nature of the evidence. This table includes every fifth question when the questions are ranked in order according to their efficacy in distinguishing between A and F students. The sampling is characteristic of the table as a whole in showing that there is an almost wholly consistent decrease in the percentages passing each item from the A to the F groups. The asterisks show inversions, one in question 16 which was passed by more D students than C students, the other in question 31 which was passed by more C students than B students. There are only ten of these inversions in the whole table. This is a very small number when it is considered that there are 170 places in the table where inversions might have occurred.

Three of the inversions occur in item 34, which is very definitely an "inversion" question, since a larger percentage of F students pass it than A students. This item is as follows:

(*explanatory*) Psychology uses the terms, instinct, insight, and imitation as explanatory principles of behavior.

The better students seemed to look for some subtle differentiation between the terms "instinct, insight, and imitation" and thus failed on the item.

SUMMARY AND CONCLUSIONS

A statistical analysis of the Wrong-Word type of objective examination question was made on the basis of the examination and class records of 938 students in Psychology 1 at the University of Minnesota. The following results were obtained:

(1) The scores on the Wrong-Word items conformed closely to the normal frequency curve and proved to be of proper difficulty. There were no zero scores and no perfect scores.

(2) The Wrong-Word items showed a consistent and statistically significant decrease in the mean scores of A, B, C, D, and F students. Indices, expressing the reliability of the differences between the means, were larger, on the average, for the Wrong-Word items than for the other three types of objective questions.

(3) High validity coefficients were found between Wrong-Word scores and the criteria. Correlations with examinations of the essay type were as high as those with objective measures. They compare very favorably with correlations found by other workers in the field of objective examinations.

(4) Odd-even reliability coefficients, corrected by the Spearman-Brown formula, compare favorably with reliability coefficients of other types of tests now in use in educational work.

(5) An analysis of the individual items indicating the percentages of A, B, C, D, and F students passing each item showed a consistent decrease in the percentages of students passing each question from the A to the F groups with only 10 out of a possible 170 inversions. One of the 34 items was clearly non-discriminative. But, in general, the Wrong-Word items were effective, according to the usual standards, when considered singly and as a whole.

TRENDS IN EVENING SCHOOL EDUCATION IN ST. LOUIS, 1859 TO 1928[1]

MILDRED FLETCHER and R. C. FLETCHER
Washington University

PUBLIC evening schools have been in operation in St. Louis since 1859 with the exception of the school year 1860-61 when there were not sufficient funds to continue the venture. The records over this period are published in the St. Louis Board of Education Annual Reports and furnish excellent material for a study of certain trends in adult education. It is the purpose of this paper to present the information in tabular form and to attempt a brief statistical analysis of some of the more important tendencies, namely, the growth of the per capita registration; the percentage of female and of negro registration to the total; the differential trends of various age groups, and the trend of city expenditures for evening school education in money values and deflated for changes in the general price level.

Evening school enrollment in St. Louis increased from 861 pupils in the first year to 23,941 pupils in 1927-28. A large part of this increase, however, is due to the growth of the city population. In order to measure the actual growth of evening school enrollment it is necessary to express the number of registrants as a percentage of the total population. Estimated annual population figures are computed by logarithmic interpolation of the Federal and City Census enumerations from 1850 to 1930. Since the laws regulating the maximum age of evening school registration vary considerably from 1859 to 1928[2] two series are constructed. The first one shows the ratio of the total registration to the estimated population. The plotting of this ratio in Chart I reveals two distinct waves of growth. The first period of growth reaches its maximum in 1877. From this date to the beginning of the 20th century there is a

[1] Prior to 1859 a system of evening schools was conducted jointly with Washington University whose trustees inaugurated the system in the first instance. St. Louis Annual School Board Report, 1872-73, p. 131.

[2] From 1859 to 1882 the registration was open to those 12 years or over. After 1883 persons over 20 years were not admitted. In 1896 persons over 20 could enroll by paying tuition of $6.50 for twenty weeks. The tuition was decreased to one dollar in 1908. In 1914 no tuition was charged and the schools were opened to those 14 years or over. The registration of children under 14 had been discouraged from 1879 but was not altogether forbidden until 1914.

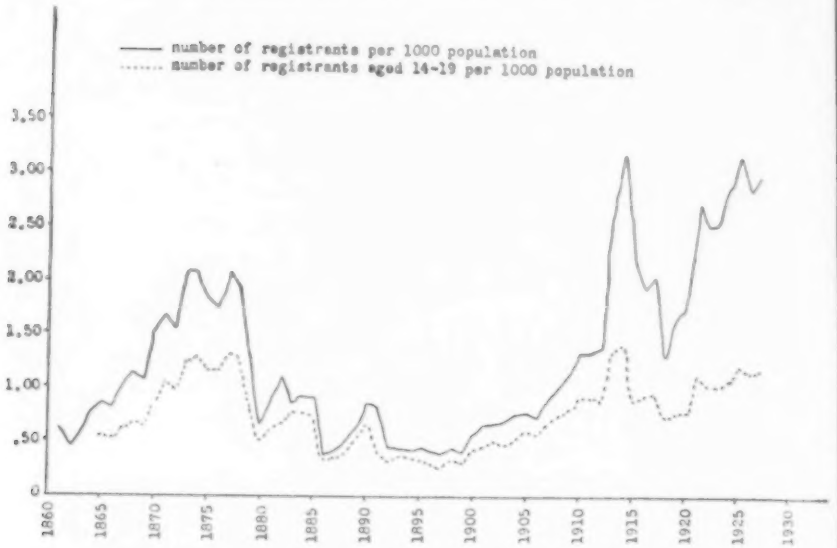

CHART I. GROWTH OF EVENING SCHOOL REGISTRATION IN PROPORTION TO THE POPULATION OF ST. LOUIS

pronounced downward trend. From 1900 there is a continual increase to date with the exception of the pronounced decline during the war period. The age group 14-19 is not affected by the changes in the policy of the Board of Education. Consequently the enrollment of this group is used as the numerator in a second ratio with the estimated population as a base. Chart I indicates that the general nature of this second index is very much the same as that of the first. A comparison of the two shows that as the per capita enrollment increases a greater number of the registrants are above the age of 19. This is partly accounted for by the increasing number of students in the regular high schools and partly by the policy of the Board in encouraging older registrants in the evening schools.

With the fuller participation of women in modern industry comes the greater necessity of their technical and vocational education. One of the most interesting features of the evening school registration reflects this tendency. Until 1900 female registration fluctuated between 7.94 and 19.98 percent of the total registration. From 1890 there existed a constant upward trend in this percentage until at the present time more than 50 percent of the total evening school registrants are female.

Evening schools were established for negroes in 1867, two years after the establishment of day schools for them. Except for the school year, 1921-1922, they constitute less than 20 percent of the total registration. Throughout the period there are four pronounced waves of negro enrollment with peaks in 1870, 1882, 1902, and 1921 respectively. The increase in negro registration after 1920 may be the result of the heavy post war migration from the South into St. Louis which reached a peak in 1922. In Chart II the percentages for women and negroes are plotted.

CHART II. PERCENTAGE OF WOMEN AND NEGRO REGISTRANTS TO THE TOTAL REGISTRATION

From 1914 to 1927 the evening school registration for both whites and negroes is tabulated by ages from 14 years to 30 years. This permits a detailed study of the average rate of growth of the registration of these age groups. The method of procedure for making this analysis is as follows. With the year 1914 as a base each year's registration is expressed as a relative to it. Straight line trends are fitted to these relatives by the method of least squares. Table I gives the formulae thus derived.

The most striking feature is the rapid rate of growth of the negro age groups. Beginning with 13.352 percent average annual increase for registrants 16 years of age the slopes of the trends rise irregularly until they

TABLE I

THE FORMULAE FOR THE TRENDS OF NIGHT SCHOOL ENROLLMENTS FROM 1914-192 BY AGE GROUPS FOR WHITES AND NEGROES [CENTERED 1914]

Age	White	Negro
14	Y = 66.659 — 3.464X	
15	Y = 83.000 — 2.855X	
16	Y = 77.029 — .477X	Y = 87.426 + 13.352X
17	Y = 48.088 + 4.426X	Y = 46.350 + 30.056X
18	Y = 62.627 + 3.387X	Y = 31.883 + 28.073X
19	Y = 53.370 + 4.020X	Y = 33.998 + 37.253X
20	Y = 53.459 + 2.347X	Y = 30.630 + 31.002X
21	Y = 46.689 + 3.960X	Y = 36.087 + 34.569X
22	Y = 48.257 + 4.422X	Y = 67.689 + 22.905X
23	Y = 45.601 + 4.479X	Y = 32.112 + 30.796X
24	Y = 49.656 + 4.009X	Y = 49.315 + 18.545X
25	Y = 53.574 + 3.681X	Y = 42.856 + 7.253X
26	Y = 56.399 + 4.576X	Y = 17.173 + 20.336X
27	Y = 54.203 + 4.716X	Y = 12.344 + 31.046X
28	Y = 58.371 + 2.811X	Y = 65.371 + 16.877X
29	Y = 54.571 + 2.044X	Y = 96.917 + 14.782X
30 and over	Y = 68.142 + 2.077X	Y = 91.913 + 3.475X

reach a peak in the 19-year age group with an average increment of 37.253 percent. Then follows a decline to 7.243 percent in the 25-year age group with a second wave rising to 31.046 percent for the 27-year age group and from there tapering off to 3.475 percent for those registering above the age of 29. With the white students the highest rate of growth is 4.716 percent for the 27-year age group. The 14, 15, and 16 year groups average an annual decline of 3.464, 2.855, and .477 percent respectively.

There is no obvious trend in the expenditure of the city per student in the evening schools from 1859 to 1900. Since 1900, however, there has

CHART III. EXPENDITURE PER REGISTRANT IN ST. LOUIS EVENING SCHOOLS

TABLE II

Data for Charts I, II, and III

Year	Total registration	Percentage of the women registrants to the total	Percentage of the negro registrants to the total	Number of registrants per 1000 population	Number of registrants aged 14-19 per 1000 population	Expenditure per student	Deflated expenditure per student*
1859-60	861	9.75				$3.80	
1860-61**							
1861-62	1149	10.61		.682		4.24	
1862-63	832	12.74		.475		3.90	
1863-64	1021	14.88		.561		3.57	
1864-65	1471	19.98		.778		4.62	
1865-66	1672	17.94		.850	.546	6.56	
1866-67	1553	12.16		.760	.532	6.20	
1867-68	2134	9.28	17.7	1.005	.616	6.40	
1868-69	2528	8.06	10.4	1.145	.698	6.21	
1869-70	2464	8.56	7.6	1.074	.672	6.77	
1870-71	3615	19.55	20.9	1.516	.864	5.69	
1871-72	4137	17.21	16.7	1.670	1.047	6.86	
1872-73	3971	13.95	12.1	1.542	.991	7.15	
1873-74	5577	12.73	13.1	2.093	1.243	5.75	
1874-75	5751	13.07	11.4	2.068	1.280	6.46	
1875-76	5273	12.32	***	1.824	1.161	6.81	$8.11
1876-77	5240	13.64		1.744	1.161	6.92	8.65
1877-78	6417	14.85	11.5	2.074	1.318	6.72	8.73
1878-79	6286	14.44	13.8	1.937	1.270	7.35	10.35
1879-80	4539	11.69	14.3	1.346	.847	6.98	9.83
1880-81	2384	10.15	9.6	.680	.534	5.82	7.66
1881-82	3300	9.84	12.6	.918	.636	5.17	6.55
1882-83	4087	13.35	19.5	1.108	.689	5.45	6.73
1883-84	3239	10.25	13.9	.856	.786	6.50	8.23
1884-85	3669	12.07	15.3	.946	.782	6.35	8.36
1885-86	3724	11.17	14.1	.936	.750	6.70	9.18
1886-87	1622	9.37	8.9	.397	.352	7.87	10.95
1887-88	1812	7.94	7.8	.433	.351	6.61	9.06
1888-89	2186	10.70	7.7	.510	.416	6.10	8.13
1889-90	2789	9.46	4.8	.633	.521	7.20	9.73
1890-91	3919	10.66	7.2	.867	.662	7.00	9.33
1891-92	3897	12.31	6.6	.848	.416	7.87	10.35
1892-93	2010	12.43	10.7	.432	.327	6.70	9.06
1893-94	2166	11.95	7.7	.446	.364	5.81	7.75
1894-95	2220	14.32	10.0	.446	.362	6.25	8.68
1895-96	2302	13.24	9.5	.452	.359	6.03	8.38
1896-97	2140	15.70	10.9	.410	.326	6.07	8.55
1897-98	2156	17.43	12.9	.403	.295	6.43	9.06
1898-99	2440	14.63	11.0	.445	.333	5.80	8.17
1899-00	2410	16.73	15.7	.429	.325	5.93	8.02
1900-01	3438	17.39	12.9	.598	.443	5.89	7.75
1901-02	3812	20.19	12.9	.671	.476	5.33	6.92
1902-03	4025	22.98	17.6	.675	.506	5.71	7.23
1903-04	4307	21.68	13.5	.710	.500	6.45	8.06
1904-05	4746	21.74	14.4	.768	.536	6.59	8.15
1905-06	4956	25.58	14.9	.788	.613	6.30	7.68
1906-07	4788	24.18	12.7	.748	.598	8.01	9.42
1907-08	5888	25.90	12.5	.904	.681	8.11	9.11
1908-09	6667	25.36	11.7	1.006	.743	8.55	9.61
1909-10	7634	23.91	8.1	1.131	.803	8.76	9.42
1910-11	9101	25.26	7.9	1.325	.918	11.10	11.55
1911-12	9259	30.12	7.7	1.332	.922	9.88	10.30
1912-13	9742	33.97	8.2	1.385	.913	10.99	11.10
1913-14	18342	41.09	7.1	2.577	1.340	12.82	12.82
1914-15	22951	42.15	7.8	3.187	1.414	13.00	12.85
1915-16	16355	43.07	9.3	2.245	.906	14.25	13.80
1916-17	14423	44.68	9.1	1.956	.934	20.08	17.30
1917-18	15281	50.26	8.9	2.048	.973	20.77	14.80
1918-19	9869	46.52	11.1	1.308	.745	23.17	14.10
1919-20	12458	46.23	12.7	1.631	.779	20.69	11.15
1920-21	13457	46.45	14.7	1.742	.812	23.60	11.08
1921-22	21176	48.17	20.1	2.715	1.135	22.18	12.46
1922-23	19859	49.43	16.3	2.523	1.037	21.96	12.92
1923-24	20081	45.24	14.1	2.528	1.024	23.33	12.89
1924-25	22740	49.16	14.0	2.836	1.080	24.83	13.72
1925-26	25137	51.94	12.8	3.106	1.194	23.03	12.38
1926-27	22956	53.24	11.7	2.810	1.131	27.62	
1927-28	23941	52.24	12.9	2.903	1.146	27.38	

* Deflated by Snyder's Index of general price level, *Business Cycles and Measurements*, pp. 286-287.

** No evening school offered for lack of funds.

*** In the school years 1875-76 and 1876-77 the registration for negroes is not given in the annual reports.

been a considerable increase. Considering the money expenditure the increase since 1900 is not only rapid but constant. This does not take into account the changes in the price level which have been quite pronounced since 1914. In order to correct the expenditures for this factor the actual dollar values were deflated by Carl Snyder's Index of the General Price Level. The difference between the two indices is portrayed graphically in Chart III. In spite of the deflation there is a definite upward trend in real expenditures since 1900.

This study of the trends in evening school education in St. Louis was undertaken in view of the interest of schools and libraries in adult education. The growth of enrollment and the nature of the growth with regard to sex, color, and age indicate the kind of response which has been made to the offer of instruction. The expenditure per student would indicate an increasing interest on the part of the administration in providing teachers and equipment. The School Board Reports reveal other evidences of interest on the part of the administration as for instance the increase of the length of the term and the great development of the curriculum. The only reports that deal in any detail with the aims of the project are those of William T. Harris in the Seventies. These reports are a delight to the social scientist.

SHORTER ARTICLES

THE MUSICAL VOCABULARY OF NEWSPAPERS AND MAGAZINES

HENRY M. KRAUS and HENRY HARAP
Western Reserve University

THE PROBLEM

THE purpose of this study is to discover the vocabulary necessary for an intelligent understanding of the musical content of magazines and newspapers. In order to select the magazines that were to form the basis of this study they were divided into four groups: (1) fiction, (2) public affairs, (3) cinema, and (4) humor. Using Ayer's *Newspaper Annual and Directory* for 1926 as a guide, those having the highest circulation for each type were selected, namely; the *Saturday Evening Post*, *Liberty*, and *Collier's* in the general group; the *Literary Digest* and the *New Republic* in the public affairs group; *Motion Picture* and *Photoplay* in the cinema group; and *College Humor* and *Judge* in the humor group. The *Nation* and the *American Mercury* were also studied for comparative purposes. The newspapers studied were the three leading Cleveland dailies: *The News*, *The Plain Dealer*, and *The Press*. Six numbers of each of the magazines and seven copies of each of the newspapers were selected during the year beginning August 1926 so as to take seasonal variations into account.

Derivatives of words were listed separately when they involved a change in meaning or when the derived form was not obvious. Compound words were listed separately only when they had a different meaning from the sum of the components. In cases of such words as *fantasy* and *fantasie*, the simplest form was used.

A total of 7,600,214 running words were read including a total of 17,676 musical terms. Eliminating all duplications the final list consists of 352 different musical terms. The table at the end of this paper gives only 214 terms which occurred at least five times.

This study does not pretend to be a complete and final list of musical terms that every person should know. Certain musical activities were not studied, such as reading phonograph records, musical literature, musical programs and program notes, and listening to the radio. Besides, a wider sampling of common reading materials would undoubtedly yield a richer

vocabulary and a somewhat different order of frequency of occurrence. The list which is presented here, however, does furnish pretty nearly all the musical terms one is likely to encounter in reading the most widely circulated magazines and newspapers.

COMPARATIVE STUDY OF THE SOURCES

Table I compares the newspapers and magazines in two ways: the size and the richness of musical vocabulary. The first column gives the ratio of the total number of musical terms to the total number of running words in each source, showing the relative quantity of musical terms in the several periodicals. The second column gives the ratio of the total number of different terms, eliminating duplicates, to the total number of running words in each source, thus showing the relative richness of the musical vocabulary in the several periodicals.

The high position of the newspapers, with respect to quantity, is due to the radio page which furnished nearly half the musical terms found in the newspapers. The high position of the cinema magazines is due to the advertisements pertaining to musical training. The low position of the periodicals of public affairs is obviously due to the absence of a musical content in politics and economics. *Judge*, *The American Mercury*, and *College Humor* rank high, possibly because they circulate among relatively intellectual subscribers.

With respect to richness of musical vocabulary the newspapers yield first place to two periodicals that are read by a comparatively small group of discriminating subscribers. The *Nation* ranks next, possibly because of its regular musical and theatrical reviews. Both cinema magazines are relatively poor in musical terms. In the humor group, *Judge* is high and *College Humor* low; in the public affairs group the *Nation* is high while the *New Republic* and *Literary Digest* are low; and in the fiction group *Collier's* and *Liberty* are moderately rich in musical terms while the *Saturday Evening Post* is poorest.

It is interesting to note the importance the radio page has assumed as a source of musical terms. It suggests the necessity of enriching the musical vocabulary of the ordinary reader. It further indicates that radio listening and radio news will play an important part in the growth of musical interest and knowledge.

COMPARISON WITH THORNDIKE WORD BOOK

In the second column following each term in Table II, a Roman numeral is given showing its position in Thorndike's list of ten thousand

TABLE I

SIZE AND RICHNESS OF MUSICAL VOCABULARY OF MAGAZINES AND NEWSPAPERS

Magazine or Newspaper	Ratio of musical terms to running words	Rank	Ratio of different terms (omitting duplicates) to running words	Rank
Cleveland News	1:184	1	1:1227	4
Cleveland Press	1:195	2	1:1205	3
Cleveland Plain Dealer	1:228	3	1:1455	6
Judge	1:284	4	1:592	1
Motion Picture	1:273	5	1:1688	8
Mercury	1:303	6	1:1151	2
Photoplay	1:380	7	1:2109	11
College Humor	1:461	8	1:2134	12
Collier's	1:476	9	1:1632	7
Liberty	1:513	10	1:1742	9
Nation	1:548	11	1:1408	5
Literary Digest	1:626	12	1:2109	13
New Republic	1:648	13	1:1752	10
Saturday Evening Post	1:706	14	1:2966	14

most common words. I means that it is among the first thousand in frequency, II indicates that it is among the second thousand; and so on. A blank in the second column indicates that the word does not appear in the Thorndike vocabulary. In making this comparison it should be borne in mind that the Thorndike list does not distinguish meanings. Therefore, some terms in the latter list such as *treble* and *tenor*, will include the frequency of musical and non-musical meanings. Where the word in the Thorndike list was obviously non-musical, such as, *key* and *flat*, it was considered as being absent from that list. In the case of compound words, in our list, the comparison was made for the principal word.

Of the 352 different musical terms found in newspapers and magazines 110 terms or 31 percent were included in Thorndike's list of ten thousand most common words. Of the 214 terms occurring at least five times, 90 terms or 42 percent were found in the Thorndike list. It appears that the vocabulary of music is technical and is acquired only by means of special training, or out-of-school musical activity. It is possible, too, that Mr. Thorndike's sources neglected certain common musical content. Undoubtedly a considerable number of the musical words now excluded from the Thorndike list will find their way into future lists of the most common words due to the increasing interest in radio music and public musical entertainments.

CONCLUSIONS

The reading of 81 issues of representative magazines and newspapers comprising over seven million running words yielded a musical vocabulary of 352 terms. The frequency of the 214 terms occurring at least five times is shown in the following table.

TABLE II

Frequency of Musical Terms in Newspapers and Magazines

	Frequency in Newspapers and Magazines	Position in Thorndike Word Book
accompany	78	II
accordion	17	
air	21	I
alto	6	
anthem	14	
aria	9	
arpeggio	6	
arrange	18	II
baby grand (piano)	47	
ballad (ballade)	31	VI
ballet	15	
band	353	I
band master	8	I
banjo	130	IX
banjo-mandolin	5	VIII
banjo ukulele	17	
bar	10	
baritone	92	VII
bass	55	VII
bass drum	5	II
basso	7	
bass viol	6	
baton	9	
beat	25	I
bell	13	I
blue	48	III
bow	13	I
brass	26	
bugle	18	IV
cadence	6	
café chantant	5	
calliope	7	
cantata	5	
carol	13	VII
castanet	7	
cello	56	
chamber music	14	I
chant	33	V
chime	31	IV
choir	83	IV
chord	39	VII
chorus	202	
clarinet	19	
classical	64	IV
clavichord	12	
color	5	I
coloratura	6	
compose	322	IV
concert	593	IV
concerto	33	
conduct	69	II
conservatory	33	
contralto	55	I
cornet	50	
counterpoint	9	
cymbals	12	VII
crescendo	7	
croon	6	
dance	219	I
début	19	
direct	39	I
discord	5	III
ditty	5	VIII
drum	91	II
duet	37	
duo	5	
encore	8	
ensemble	85	
evensong	8	I
fantasy	8	IX
fiddle	57	VI
finale	5	
flat note	17	
flute	41	V
folk song	14	I
fox trot	23	
fugue	6	
glee club	34	
gong	6	X
grand (piano)	84	
guitar	10	VIII
hammer	5	II
harmonica	67	
harmony	100	III
harp	52	III
harpsichord	74	
Hawaiian guitar	30	VIII
homophony	5	
horn	36	II
hum	34	III
hurdy-gurdy	5	
hymn	79	IV
impressario	5	
instrument	620	III
intermezzo	7	
jazz	317	
kazoo	6	
key	68	
keyboard	22	
libretto	18	
lilt	11	
lullaby	5	VII
lyre	5	
lyric (n)	18	
lyric (a)	9	
maestro	5	
major	12	
mandolin	56	
march	63	I
measure	9	I
melody	234	IV
mezzo-soprano	6	
minor	8	
minstrel	37	
minuet	12	
modulation	9	
movement	14	
music	2445	I
musicale	37	
musical comedy	129	V
musical saw	7	III
music box	23	I
muted	13	
natural	8	
negro spiritual	20	
nocturne	8	
note	175	
obligato	34	
oboe	9	
octave	7	
octet	14	
opera	409	
operetta	34	
opus	20	
oratorio	8	
opera comique	11	
orchestra	1331	
organ	348	
overtones	20	
overture	30	
petit symphony orchestra	5	
phonograph	163	
phrase	5	
piano	1002	
piano accordion	6	
pianoforte	8	
piccolo	14	
pitch	26	
plectrum-banjo	7	
polyphony	5	
prelude	20	
première	7	
prima donna	13	
prologue	7	
quartet	197	
quintet	22	
range	18	
recital	241	
reed	10	
refrain	8	
repertory	10	
requiem	5	
rhapsody	11	
rhythm	64	
Saengerfest	11	
saxophone	251	
scale	48	
scherzo	7	
score	28	
serenade	44	
sextet	10	
sharp	6	
sing	919	
solo	242	
sonata	15	
song	626	
soprano	117	
spinet	6	
staccato	8	
stop	9	
strain	29	
string	143	

	Frequency in Newspapers and Magazines	Position in Thorndike Word Book		Frequency in Newspapers and Magazines	Position in Thorndike Word Book		Frequency in Newspapers and Magazines	Position in Thorndike Word Book
	9		treble	5	VIII	viola	30	
	18		tremolo	5		violin	280	V
	8		trio	100		violoncello	7	
	251	X	triple bass	13	VII	virginal	8	
	61		trombone	59		virtuoso	18	
	21		trumpet	73	III	vocal	119	V
	158	VI	tuba	13		voice	179	I
	44	V	tune	161	III	volume	34	II
	221	II	ukulele	102		waltz	55	I
	10		valse	5		wood winds	7	I
			variations	7	X	xylophone	14	

Newspapers rank high with respect to size and richness of musical terminology due to the radio page. This suggests the necessity of enriching the musical vocabulary of the average reader.

Periodicals which circulate among the intellectual class are rich in musical content due to the musical and dramatic reviews.

Of the 352 musical expressions found in newspapers and magazines, 110 expressions or 31 percent were included in Thorndike's list of ten thousand most common words. Of the 214 terms occurring at least five times, 90 terms or 42 percent were found in the Thorndike list.

THE CONSTANCY OF SPELLING ABILITY AMONG UNDERGRADUATES

GEORGE W. HARTMANN
Pennsylvania State College

STATEMENT OF PROBLEM

THIS paper is concerned with the nature and extent of the changes in spelling performance during the college course. Is the growth curve of this function like that for general information which advances steadily from year to year as a result of exposure to academic influences, or is it like handwriting, the quality of which regresses even in high school? Specifically, at what stage in his educational career does the average student reach his ultimate level of accomplishment in this subject?

METHOD AND RESULTS

A spelling list of fifty words common to both the Thorndike and Horn Word Books was dictated slowly to a large random sample of Pennsylvania State College undergraduates who printed their responses upon a prepared sheet. Ambiguity was avoided by means of illustrative sentences.

Table I gives the basic data. Since the test was made about June 1st, the college classifications refer to the end of the respective years.

TABLE I

AVERAGE SPELLING ACHIEVEMENT OF THE FOUR COLLEGE CLASSES
(RELIABILITY = .84 ± .007)

Class	N	Mean
Seniors	181	39.09
Juniors	178	39.54
Sophomores	165	38.42
Freshmen	112	34.61
Men	488	37.50
Women	148	40.64
Total	636	38.25

From these figures it would appear that the greatest changes in student spelling occur between the freshman and sophomore years, and that thereafter the differences are negligible. The incidental superiority of the women in this study is consistent with all that is known of the relative academic accomplishment of the two sexes.

The suspicion that progress in spelling during the college period is practically at a standstill was confirmed by an examination of the individual items of the test, from which it appeared that the relative percentages of error made on each word remained approximately constant from year to year. Without exception, items which were easy (difficult) for seniors were easy (difficult) for freshmen.

An interesting check of this finding was made by correlating the freshman percentage errors for each word with those of the other classes. The high correlations imply that what was hard for one group was also hard for the others, although this fact alone would be consistent with widely different mean scores.

TABLE II

CORRELATIONS BETWEEN FRESHMAN PERCENTAGES OF ERROR ON SPELLING LIST AND THOSE OF OTHER CLASSES

	Freshman
Sophomore	.83
Junior	.97
Senior	.90

Since the amount of improvement with succeeding years is so slight, it seems clear that maturation—at least at this period of life—is an irrelevant factor. The correlation between spelling scores and age in months for all 636 subjects was .008 with a PE of about the same amount.

Much more significant is the association of spelling ability with intelligence. For 629 subjects the r between spelling scores and the

DeCamp Intelligence Test was .42 ± .02. It is probable that this relation alone may account for the major leap in accomplishment from the freshman to the sophomore year because of the well-known initial mortality of the less competent.

SUMMARY AND CONCLUSIONS

Fifty words, common in the vocabulary of the educated adult, were spelled by 636 college students. After the freshman year the mean scores of each class remained surprisingly alike. The relative ease and difficulty of various items continued essentially unaltered. It is suggested that the slight increment from the freshman to the sophomore year may be an artifact due to the elimination of the less intelligent.

A STUDY OF HIGH-SCHOOL PUPILS TO DETERMINE THE EFFECT OF STUDENT COUNCIL PARTICIPATION ON THE FORMATION OF CERTAIN HABITS OF CITIZENSHIP

BURT A. MAYBERRY
Lincoln High School, Kansas City, Missouri

DOES participation in student government by high-school students aid in the formation of habits of citizenship? A study of the literature on this subject reveals a rather decided opinion that it does. In fact, most writers justify the widespread interest and activity in student government on some such basis. This study, which is an attempt to ascertain experimentally an answer to the above question, presented at the outset two major difficulties. The first difficulty was adequate measuring instruments in the form of valid and reliable tests, and the second, was a technique with which to proceed.

After a careful survey of the field of objective tests, the following were selected: Sims Score Card for the Measurement of Socio-Economic Status; Otis Self-Administering Tests of Mental Ability, Higher Examination, Form A; and Chassell-Upton Citizenship Scales, Forms G and H.

Thirty-nine students who were members of the Student Council of Lincoln High School at Kansas City, Missouri, were paired with thirty-nine students of the same school who were not members of the Student Council. The items used for pairing were: sex, grade-level, socio-economic background derived from the use of Sims Score Card, and mental age obtained from the administration of the Otis Self-Administering

Tests of Mental Ability. The Student Council members made up the experimental group, Group A, and the paired students who were not members of the Student Council made up the control group, Group B.

For the purpose of measuring progress in citizenship training, the Upton-Chassell Citizenship Scales, Forms G and H, were used. Each member of Group A and Group B was marked on these scales by two teachers in the early part of the second semester. The advisers of each of the students made up one group of teachers and one other teacher for each student made up the other group. Weighted scores, obtained by reducing the scores of these two groups of teachers to the same standard deviation, were computed, which represented the initial status of each member of Group A and Group B.

During the period of the experiment, there was no change from the regular procedure and activities of the student council. The members of Group A pursued their regular school programs and participated in the activities of the student council, which included the following: attending student council meetings; reporting to their groups concerning these meetings; planning and executing three school socials; organizing a court with regular procedure to try students for minor offenses; planning and executing fire drills; and organizing a book exchange. The members of Group B pursued their regular school programs, but took no active part in the activities of the student council. In neither case were the students aware that they were under observation.

Near the close of the second semester, the same teachers were asked to score each member of Groups A and B on Forms G and H of the Upton-Chassell Citizenship Scales. Weighted scores, derived in the same manner as for the initial test, were computed, and represented the final status for each member of Group A and Group B.

The change, in terms of the difference between the initial status and the final status of each member of Group A, was computed. These changes were thrown into a frequency distribution and the following results were noted:

(a) the mean of the distribution of changes was 12.85
(b) the standard deviation of the distribution of changes was 10.45
(c) the standard error of the mean of the distribution of changes was 1.6.

In a similar manner the changes in Group B were computed and placed in a frequency distribution with the following results:

(a) the mean of the distribution of changes was 0

(b) the standard deviation of the distribution of changes was 8.0

(c) the standard error of the mean of the distribution of changes was 1.2.

Comparison of the mean of the distribution of changes for Group A with the mean of the distribution of changes for Group B revealed a positive and significant difference in favor of the experimental group. The standard error of the difference was 2.0.

In an effort to determine the reliability of the difference, the experimental coefficient was computed according to the formula $\frac{D}{2.78\ SDD}$. The experimental coefficient was 2.3.

The interpretation of such an experimental coefficient, according to McCall,[1] is: if the experiment was repeated a large number of times, one can be practically certain that a positive difference would exist in favor of the experimental group.

This experiment leads one to conclude that participation in the activities of student government by students of high-school grade does aid in the formation of such habits of citizenship as are measured by the Upton-Chassell Citizenship Scales.

[1] McCall, William A. *How to Experiment in Education* (New York: Macmillan Company, 1923), pp. 154-157.

EDITORIALS

SUPERVISION AS PURPOSEFUL PROBLEM SOLVING

Professor John L. Childs in a recent book on *Education and the Philosophy of Experimentalism* (Century Company) makes the following point in discussing the Dewey-James-Pierce philosophy of education:

"Freedom, initiative, and activity for children in the schoolrooms are all promoted by this conception of growth as continuous learning from the active process of experiencing. The view of education as the process by which the benevolent teacher pours into reluctant minds all sorts of cut-and-dried subject-matter is compelled to give way to a program of purposeful activities by, of, and for children. Education comes to be thought of less as something that the teacher is to do, and much more in terms of what children are to do. There is still large scope for teacher activity and guidance, but under this ideal it is directed to the enrichment of the activities of children rather than serving as a substitute for such activities. The infallibility and arbitrary authority of the teacher disappear. 'The *teacher* also becomes a learner and the *learner* also becomes a teacher.' "

Dr. Childs in the above quotation is discussing current methods of classroom instruction. He might, however, have written in very much the same manner about supervision, or at least of the in-service teaching of teachers how to teach. Many supervisors, benevolent and otherwise, make of supervision just so much machinery by which they may "pour into reluctant minds all sorts of cut-and-driew subject-matter" about teaching. Good supervision, on the other hand, has come to mean, more than ever before, purposeful problem solving. This idea is further developed in an editorial, "Research for Teachers," in the June, 1929, issue of the *Journal of Educational Research,* and in a second editorial, "Supervision and the Scientific Method," in the September, 1931, issue of the *Journal of Educational Research;* and more recently in the writer's *Introduction to the Scientific Study of Classroom Supervision* (D. Appleton and Company). Buckingham expressed the idea in an editorial on "The Public-School Teacher as a Research Worker" in the April, 1925,

issue of the *Journal of Educational Research*, and later in his book, *Research for Teachers* (Silver, Burdett and Company). Woody expresses the idea in an article on "The Values of Educational Research to the Classroom Teacher" in the October, 1927, issue of the *Journal of Educational Research*.

In opposition to the point of view expressed above is what appears to be a curious conflict in education. The educational camp appears to be divided into two groups: (a) the scientific experimentalists and (b) the so-called progressives. The scientific experimentalists are frequently referred to as formalists, and the so-called progressives as intangibilists, while as a matter of fact it would appear, if each saw the ultimate implications of his position, that the experimentalists are real promoters of democracy, creative thinking, and respect for individuality, and that the so-called progressives are ultimately experimentalists—at least in terms of Dewey, James, and Pierce. Without settling the age-old issue of whether the man is the product of his times or vice versa, it appears relatively certain that the followers of Dewey, James, and Pierce have divided themselves into two groups: one group stressing the *methods* of these men (or of their times); their methods of work, thinking, etc.,—in short, experimentalism; and the other stressing the *products* of their minds: their tentative hypotheses, their preachments on democracy, creative thinking, and respect for personality. If the writer's memory serves him correctly, the followers of Herbart also divided themselves in much the same manner: the one group stressing the psychologizing and the scientific study of teaching, and the other stressing the five formal steps, correlation or concentration, the culture epoch theory, etc.,—products, in reality hypotheses, of Herbart's psychology. The only point that the writer desires to make here is that he believes that there is no fundamental conflict between democratic and scientific supervision. The best supervision, after all, is that of purposeful problem solving.

A. S. Barr

REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Miami University, Oxford, Ohio.

SWIFT, FLETCHER HARPER, *Federal and State Policies in Public School Finance in the United States.* Boston: Ginn & Company, 1931. xvii + 472 pp.

This book's purpose is to furnish the knowledge and evaluation of existing practices upon which progress in public school finance must be based. "The progress thus far made is needlessly and indefensibly slow." This is true notwithstanding that "the more unsound, the more disastrous, the more indefensible in every respect is a fiscal policy, the more widely will it be found in the support of schools."

To achieve this purpose the presentation is in three parts. Part I traces the history of federal aid to schools with chapters covering the creating, increasing, and squandering "the heritage." Part II covers state policies with a chapter on the growth of school costs, four chapters on the state's part in school support, two chapters on sources of school revenues, and four chapters on specific uses of state school aid. Part III describes as typical state systems of school support, Arkansas in 1921, Delaware in 1926, Massachusetts in 1922, Utah in 1925, and Wisconsin in 1926.

The method is exclusively that of discovering the policies and their results from the facts of history and of status in the last years treated. In addition to important documentary and statistical facts, of which he probably has the greatest collection in this field in the country, Dr. Swift was at pains to get more facts by correspondence and interviews.

The book achieves its purpose. When Dr. Swift reaches a conclusion, it will stay reached for anyone to whom facts appeal. He has at times even understated, e.g., certain statistical increases if referred to their bases, would have been even greater than he thought.

Recent developments in state aid have been so rapid that even a Swift could hardly fly fast enough to keep up with all of them. Furthermore, securing the full facts of all these developments from documentary sources is an impossible task. In spite of the difficulties involved, Dr. Swift's portrayal as checked by the personal knowledge of the writer of the conditions in several states, seems on the whole to be a fair and accurate one.

Much of the material has appeared in print before, but it has not been accessible except to specialists in finance who collect widely scattered publications in their field. Dr. Swift has done a distinct service in bringing the fragments together and making them available in one book. This will be highly valuable for university courses in school finance, state departments of education, and state officials and friends of education in any state who are thinking of a wiser use of their state school money or of increasing it. For all such the book will be a gold mine of useful facts and conclusions.

CARTER ALEXANDER
Teachers College, Columbia University.

KENT, RAYMOND A. *Higher Education in America.* Boston: Ginn & Company, 1930. x + 689 pp.

The editor states in the preface of this book that too much attention has been given to opinion and theory in the development of the content of courses in higher education in colleges and universities; more attention should be given to facts regarding the objective features of curricula and organization and administration. His statement regarding the development of the scientific movement in higher educational institutions leads one to infer that the book is to be filled with nuggets of factual material treated from a scientific standpoint. A glance through the list of names which appear in the table of contents adds strength to this inference.

Much of the book falls short in achieving the purposes which the editor aims to accomplish. It has merit in bringing together factual treatments and theoretical opinions that are characteristic of a number of distinguished educators. It assembles in convenient form material which has previously been available only in scattered and fugitive papers and addresses. Even though the several chapters were specially written for use in this publication many of them are obviously rehashes of old material and in several instances rehashes somewhat hastily and carelessly done. It is unfortunate that errors in reporting factual material were not observed before publication. The selected bibliographies are rather uniformly poor. One imagines that the capable editor of the collection must have been embarrassed by the fact that some of the men who had been invited to contribute were so distinguished that their papers could not be rejected.

The collection is in no proper sense a symposium. It is rather a successful attempt to provide a reasonably complete treatment of higher education through the labor saving device of assembling treatments of various phases of the field by authorities in the field. The book should be useful to anyone who is somewhat technically interested in higher education. No one who does not have access to a rather large library of the higher educational literature of the past ten years can afford to be without this volume.

ARTHUR J. KLEIN
Ohio State University.

WATSON, GOODWIN, AND SPENCE, R. B. *Educational Problems for Psychological Study.* New York: The Macmillan Co., 1930. xii + 252 pp.

This book represents a new approach to the teaching of educational psychology. It purports to be a syllabus on the problems encountered in everyday classroom situations and other types of school activity, worked out on the assumption that the greater part of a teacher's success or failure may lie in the direction of problems of teacher personality, ability to guide and direct the whole child, coöperative community effort, and many other factors beside the imparting of information and the development of skills in children.

It has some fine qualities, but it also possesses some weaknesses. First of all, it covers too much ground inadequately. In its 352 pages, including more than 75 pages of bibliography, an attempt is made to cover the following array of topics, and to present specific problem cases for each of the divisions in which the major topics might be divided. The chapter headings indicate the variety of material included: Studying, Measurement, General Method, Among Curricula, Special Methods, Extra Curricular Activities, Character Training, Delinquency and

Crime, Problems of Administration, Problems of Intellectual Adjustment, Vocational Psychology, Causes of Individual Differences, Emotional Conditioning, Abnormal Psychology, Adult Education, Social Attitudes, Group and Community Relationships, Selection and Measurement of Teachers, Questions of General Psychological Interest, and in the appendix—A. B. C. of Educational Psychology, Principles of Mental Hygiene, Suggestions for Leading Effective Group Thinking, and Suggestions for Counseling.

As an example of what is meant by inadequacy of treatment, let us take the chapter devoted to Measurement. In this section, covering only 14 pages of case reports and questions, the following subtopics are brought up: Intelligence, individual tests, testing program, character tests, measuring morals, rating scales, standard and achievement tests, teachers' examinations (new type tests, etc.), and marks and marking systems. It is evident that it is a very ambitious undertaking, even with the help of a good bibliography, to present such an array of topics adequately, while giving so much space to case studies in the narrow limits of 14 pages of material.

The arrangement of the book is new, so far as a study text for educational psychology is concerned. There is practically no author discussion of the problems introduced. The body of the book is composed of case reports gathered from all fields of educational practice, each of which is followed by a series of four or five questions covering phases of interpretation of each case. It is hard to know just exactly what level of students the book is designed to help. The cases are simply and clearly stated, but proper interpretation and utilization of the desired psychological principles is left entirely in the hands of the student and the discussion leader of the group. From the viewpoint of the reviewer, the book would be most valuable as a supplementary text in a course where the psychological principles had received emphasis in some concrete form. The syllabus would, however, provoke a meaningless maze of mixed up ideas and foundationless thinking in the case of anyone not familiar with the fundamental principles of educational psychology and mental hygiene. The untrained teacher in the field would not be particularly helped by this book, for with no adequate library facilities there would be no opportunity to check one's reactions to the problems in the light of modern thought.

There are some distinct advantages in owning such a book, however. It presents an outline of the major problems in educational psychology so that any teacher of psychology may find help in utilizing the contents in connection with a course in educational psychology. It is filled with cases of everyday experience which offer practical illustrative and discussion material for small groups. But most of all it is valuable for its extensive topical bibliography. The authors have rendered a distinct service in bringing together these sources of material.

In the appendix of the book is presented the fundamental principles of educational psychology and mental hygiene, and also suggestions for leading effective group thinking and for counseling. This material, along with Chapter XIX on Questions of General Psychological Interest, is a great help to the book, and ought not to be submerged in the back of the book. These principles are essential to the proper use of the syllabus, and probably would have been of greater value had they been worked into the body of the book.

I am glad I have the book. It repre-

ents a step in the right direction and should stimulate many teachers of educational psychology to take the dry and possibly unattractive psychological principles and clothe them with the vitality of real life as found in everyday classroom practice.

BERT A. NASH
University of Kansas.

STORM, GRACE E., AND SMITH, NILA B. *Reading Activities in the Primary Grades.* Boston: Ginn & Company, 1930. VIII + 376 pp.

Those interested in the development of scientific method in education will welcome the appearance of *Reading Activities in the Primary Grades* by Grace E. Storm and Nila B. Smith. Many writers, in attempting to be practical, fail to stress sufficiently the theory underlying the procedures which they suggest. Storm and Smith have made a distinct contribution to the field of primary reading in that they have given a scholarly and scientific presentation of the subject. They have provided for an intelligent interpretation of reading method in the primary grades by giving a background of the history of content and method, the social conditions that have caused changes, and scientific research in reading.

The material is clearly and simply written and is illustrated by many concrete examples. Each chapter is introduced by an outline of the content that follows, and is concluded by a brief, concise summary of the main points that have been presented in the chapter. The bibliographies are, for the most part, selective, basic, and up to date. The subject in all of its phases is presented in the light of the contributions of experimental work in the field of reading.

The content of the book is divided into three parts: Background, Procedure, and Testing and Remedial Work. The first division gives a brief historical account of the three successive stages of method—the alphabetic, the sound, and the word—through which reading passed before reaching its present status. The reviewer regrets to find extreme condensation which stresses the wide gap between the McGuffey's series and the present-day readers of "fact and realistic material based upon the child's experiences in a natural environment." Some mention of the materials which show the gradual change after 1880 would supply a needed transition. The changing social needs, as the potent factor in the development of reading content and method, and the influence of scientific investigations upon instruction are effectively emphasized. The psychological basis for motivation is explained in simple terms, and the motives that are suggested for the different types of reading activities are made very concrete by the accompanying photographic illustrations. The investigations in eye-movement and the results of important findings to the teaching of reading are briefly surveyed.

The second division of the book, Procedure, gives in illustrative detail discussions, suggestions, and type lessons for reading activities in the kindergarten and each of the primary grades. Specific suggestions are made for the equipment and arrangement of the classroom which is conducive to good reading, and the function of the kindergarten in the reading program is clearly pointed out. The topics which receive special attention in the chapters are reading in the first, second, and third grades are: general and specific objectives, essential activities, various experiences which serve as reading stimuli, time allotment, relationship between silent and oral reading, specific

reading abilities, desirable levels of achievement, and testing results. The discussion of phonetics and word-recognition surveys the investigations that have been made in the field of phonetic analysis. The limitations of experimental evidence in this subject are pointed out, and the different methods of teaching are explained. The authors attempt to meet the ever-present problem of seatwork by giving a great variety of seatwork activities related to reading. One might question some details of method, such as having primary children write out answers to questions (pp. 193 and 195). On the whole, however, this book is probably the most reliable guide that is available.

The last division, Testing and Remedial Work, stresses the values, the preparation, the giving, and the scoring of informal ("home-made") tests and gives abundant illustrations of the different types. The purposes, principles for selection, and the use of standard reading tests are clearly stated, and the most widely-used Standardized Primary-Reading Tests are described. The phases and causes of reading deficiencies, and specific remedial measures are included in the closing chapter. This part of the book should prove of invaluable service to both the teacher and the supervisor of primary reading.

This textbook meets a real need in college courses in primary reading and in the primary classroom. The organization, the style, and the content combine to accomplish in a large measure the purpose stated by the authors: "to present practical information and methods of procedure in such form that both teachers and supervisors will find it a helpful guide in the study of the problems of the reading class."

CORA M. MARTIN
University of Texas.

MCALLISTER, JANE ELLEN. *The Training of Negro Teachers in Louisiana.* New York: Columbia University, 1929. vi + 95 pp.

The aims of this study, as stated by the author, are as follows:

1. To give the necessary national, sectional, and local background for the understanding of the Louisiana situation.
2. To describe actual conditions for training teachers in Louisiana.
3. To point out some weaknesses in the present program of teacher training.
4. To encourage Louisiana to make even greater improvement by showing what North Carolina, with similar handicaps, has done.
5. To make constructive recommendations regarding the training of teachers in Louisiana.

Within the limitations imposed by the brevity of the study, all these aims have been excellently carried out. Especially well done is the sketching of the background against which the constructive portion of the study is projected. The pages devoted to existing conditions, weaknesses, and needs in the Louisiana program for the training of Negro teachers give an illuminating cross-section of an educational problem which is too little understood even by those who live constantly in close contact with it.

In making definite suggestions for a future program in teacher training, the author necessarily ventures from a field of verifiable data into one closely akin to prophecy. The program is good if the prophecy comes true. But changes in the whole range of Negro education are taking place so rapidly that it is hardly possible to guess at the developments of the next twenty years on the basis of what has happened in the past twenty. Witness a single event of tremendous importance for Negro education in Louisiana, which came about while the present study was in the press

—the development of the plans for the splendid new Dillard University of New Orleans. It seems probable that the chief value of the volume will be historical rather than predictive.

But it has another value which should not be overlooked, although it may appear to be a sort of by-product of the study. Merely to be told that there are still sections of our country where forty-five dollars are being spent on the education of a child of one race while a child of another race in the same locality must get along with eight dollars; where 71 percent of the teachers in rural schools have had less than two years of training beyond elementary grades; where there are 283 state approved high schools for children of the white race, and only four for an approximately equal number of children of the Negro race—these facts offer a challenge of the first order to all who believe that in a reasonably equal chance for a sound education for "all the children of all the people," lies the key to the success or failure of our experiment in democracy.

HENRY W. COBB
Tougaloo College, Tougaloo, Miss.

STONE, CLARENCE R. *Supervision of the Elementary School.* Boston: Houghton Mifflin Company, 1929. xix + 573 pp.

This book is intended primarily for the elementary school principal. Its dominant purpose is to put into the hands of this school officer the techniques for acquiring, coöperatively, superior classroom instruction. It represents an endeavor to help the principal "make good" in the proposition; that the supervisor and the teacher and the pupil is greater than the teacher and the pupil. The book also offers specific help to any one engaged in the field of general supervision, and claims particular adaptation as a textbook in university and college courses in the supervision of instruction. Within the bounds of seventeen chapters, the author deals concretely and clearly, although at times tritely, with the problems of the objectives of supervision by the principal, how the principal may find time for supervision, relationships between the principal and other supervisors, general supervisory techniques which have been used, methods of determining supervisory needs in a school, and the supervision of each of the twelve elementary school subjects.

There is nothing particularly new or original in the field of supervision offered in the book. In fact, large blocks of it are quotations from the yearbooks of the Department of Elementary School Principals, the Department of Superintendence, and the National Society for the Study of Education. The author has in an unusually clear and usable style, however, assembled what has already been written in the field of supervision, and organized it around the commonest problems which an elementary school principal must meet. He has organized it also with a definite purpose in mind, that of "making teachers intelligently self-helpful, rather than merely imitative of procedures set for them." Some of his readers will no doubt be disappointed that such a large share of his illustrations of desirable educational practices are drawn from the schools of the far west. In fact his definite avoidance of any mention of certain centers and fields of research makes one wonder whether the author is ignorant of them or whether he has deliberately ignored them.

An outstanding feature of the book, and possibly the author's greatest contribution is the group of "standards" or

"principles" which form the skeleton of practically every chapter. They are brief recommendations, usually a sentence in length, of what the author finds to be the best present practice in regard to elementary school problems. Many hours of futile search and aimless trial and error gestures may be saved the principal by reference to these "standards." A regrettable weakness, however, in connection with them is the infrequent reference to the specific pieces of research which would substantiate the author's recommendation of each standard.

To those who wish to use the book as a text with classes studying supervision, no doubt the "problems for study, reports, and discussion" found at the close of each chapter will prove valuable. For the most part, these suggested assignments are stimulating and replete with possibilities. Almost without exception they represent practical problems. They are frequently too long, however, often indicating work which it would take several weeks to accomplish, and they ask for decisions on questions which the most noted educators in the country admit that we as yet have no solution for.

One respect in which the book is most disappointing and altogether inadequate is the dearth of material in regard to a problem of absorbing importance to supervisors, that of so-called child-centered activities in the school program. No principal to-day can afford to ignore this problem. He cannot adequately lead his teachers without knowing something about it. No movement in modern education probably has greater significance. Certainly nothing has greater possibilities for disintegrating the elementary school if ignorantly handled. Yet Mr. Stone scarcely mentions the whole movement.

In spite of omissions, and the mention of these should not be inferred as reflections on what is included, this book probably offers one of the most concise, clear, and usable handbooks which has yet been prepared for the elementary school principal.

MAUDE MCBROOM
State University of Iowa.

BATSON, LIONEL. *A Select Bibliography of Modern Economic Theory*, 1870-1929. New York: E. P. Dutton & Co., 1930.

This volume, obviously intended for English students, presents a fairly complete subject index in the field of Economic Theory. Every phase of Economic Theory is covered from value to public finance. Its value to American students particularly in the larger colleges and universities may be doubted, inasmuch as the libraries in such institutions generally carry exhaustive reference citations to authors and subject matter.

E. S. TODD
Miami University.

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

HAMMONDS, CARSIE. "The Distribution of Time of Teachers of Vocational Agriculture in Kentucky: Its Relation to Distribution of Aid and to Teacher Training," *Bulletin of the Bureau of School Service*, University of Kentucky, III (March, 1931), 113 pp.

Contains a statement of the problem, a study of the distribution of departments of vocational agriculture, how teachers of vocational agriculture distributed their time, the relation of bases of aid, various non-vocational activities, and the distribution of time of Kentucky teachers, with conclusions.

HARRIS, DANIEL. "The Relation to College Grades of Some Factors Other Than Intelligence," *Archives of Psychology*, No. 131 (July, 1931), 55 pp.

A correlation study of college achievement, attitude, personality, recreation, extra-curricular activities, etc., with a summary of previous investigations and bibliography.

HAYES, MARY H. S., DIRECTOR. *Opportunities for Vocational Training in New York City.* 122 East 25th Street, New York City: The Vocational Service for Juniors, September, 1930. 96 pp.

This bulletin contains a statement of the conditions under which minors may work, with a list of schools offering opportunities for vocational training in New York City.

HENMON, V. A. C., AND HOLT, F. O. "A Report on the Administration of Scholastic Aptitude Tests to 34,000 High School Seniors in Wisconsin in 1929 and 1930," *Bulletin of the University of Wisconsin*, Serial No. 1786, General Series No. 1570 (June, 1931), 104 pp.

Contains a statement of the problem, an analysis of the results of the Ohio State University Psychological Test on 16,000 high school seniors in Wisconsin, scores for those declaring an intention to enter college, scores for those who did not enter college, school and community differences in scholastic aptitude; sex differences, occupational preferences, parental occupation, the selection of students by different institutions, the selection by colleges, schools, and courses within an institution—all in relation to scholastic aptitude; the value of scholastic aptitude tests in predicting success in college, combinations of various criteria on the prediction of college achievement, and personality measurements and scholastic achievement.

HORSTICK, SIMON MOTTER. *A Study of Sources of Revenue for Public Education in New Jersey.* Doctor's Thesis in Education, Philadelphia: University of Pennsylvania, 1931. 140 pp.

Contains a statement of the problem;

wealth, duty, and effort; the economic factors as bases of taxation; the suggested plan of taxation, and an appendix.

LIDE, EDWIN S. "Constitutional Basis of Public School Education," *United States Department of the Interior Leaflet*, No. 40 (July, 1931), 11 pp.

A statistical analysis of constitutional provisions relating to the organization of schools, their support and control.

MURRAY, GEORGE STEPHEN. *Accounting for Depreciation of School Buildings.* New Haven, Connecticut, 1930.

A mimeographed bulletin setting forth the problem and its importance, commercial and municipal depreciation practices, the depreciation of school buildings, principles of depreciation, the technique for computing depreciation allowance, etc.

NEWMARK, DAVID. *A Study of a Class in the Philadelphia Normal School.* Doctor's Thesis in Education. Philadelphia: University of Pennsylvania, 1931. 150 pp.

Contains a statement of the problem, the characteristics of this class, the relationships between normal school achievement and pre-normal school status, normal school achievement and normal school status, and normal school achievement and social background.

"The Outlook for Rural Education," *Research Bulletin of the National Education Association*, IX (September, 1931), 231-302.

Contains chapters on the scope of the problem of rural education, efficient units of administration, adequate financing, better attendance in rural schools, a living and growing curriculum, better teaching in rural schools, rural school interpretation, trained teachers for rural schools, secondary school opportunities for rural children, rural school buildings and equipment, rural teachers and helpful supervision, and bibliography.

RADTKE, BRUNO. (Studienrat, Berlin, Germany; Exchange Master, London, England, 1929-30; Visiting Instructor, University of Kansas, 1930-31.) "Some Observations on German and English Education in Elementary and Secondary Schools," *Kansas Studies in Education*, II (June, 1931), 36 pp.

Contains comments upon the school organization in Germany following the World War, changes in method, the curriculum, the youth movement, and relation to outside agencies. The second part of the bulletin relates to recent developments in the English school systems.

SHERBON, FLORENCE BROWN, AND FERRIS, EMILY. "The Experience and Opinions of 350 Married Women Graduates of the University of Kansas: with Reference to the University Curriculum and Problems of the American Home," *Kansas Studies in Education*, II (June, 1931), 30 pp.

Contains an analysis of the expressed opinions of 350 married women graduates of the University of Kansas with reference to the University curriculum in relation to the various aspects of the domestic life of these women.

STRETCH, LORENA B. "The Relation of Problem Solving Ability in Arithmetic to Comprehension in Reading," *George Peabody College for Teachers Contributions to Education*, No. 87 (1931), 47 pp.

An experimental study from which the author concludes that the training of students for definite and specific purposes as

described in this investigation is distinctly worth while.

WOODY, CLIFFORD. "Results of the May Testing Programs in the Elementary and High Schools of Michigan, 1931," *Bureau of Educational Reference and Research Bulletin*, No. 140 (August 30, 1931), 47 pp.

This report gives the results of the testing program which was carried on in the elementary and high schools of the state of Michigan during the second week of May, 1931.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

BROWNING, MARY, HOWARD, BONNIE C., AND MODEROW, GERTRUDE. "Supervisory Reading Program," *Educational Method*, XI (October, 1931), 32-38.

The authors set up a remedial program in reading with statistical results showing that there is a marked increase in reading ability after the application of this program.

TURNEY, AUSTIN H., AND HYDE, M. F. "The Attitude of Junior High School Pupils Toward Ability Grouping," *School Review*, XXXIX (October, 1931), 597-607.

A questionnaire study of the responses of 645 junior high-school pupils to ability grouping.

EXPERIMENTAL STUDIES OF LEARNING AND TEACHING

BELL, HUGH M. "Study Habits of Teachers College Students," *Journal of Educational Psychology*, XXII (October, 1931), 538-543.

The author presents evidence on the study habits of college students and the relation of these to scholastic standards.

EHINGER, GERTRUDE. "Decline of Aptitudes with Age (*Déclin des Aptitudes avec l'Age*)," *Archives de Psychologie*, XXIII (April, 1931), 67-73.

From an experimental study of factory and non-factory workers, the author shows that there is a decline in aptitude with age, but that the amount of decline varies with the kind of life of the subject.

FREEMAN, FRANK N., AND HOEFER, CAROLYN. "An Experimental Study of the Influence of Motion Picture Films on Behavior," *Journal of Educational Psychology*, XXII (September, 1931), 411-425.

An experimental study carried on in two fifth and two sixth grade classes with and without films in health instruction. The film group gained less on the information test, a slightly greater use of the toothbrush, a slightly more favorable showing with reference to materials read, and slightly better results from a dental examination. The differences are, however, for the most part, slight and inconclusive.

GUILER, WALTER SCRIBNER. "Difficulties Encountered by High-School Graduates in the Use of Pronouns," *School Review*, XXXIX (October, 1931), 622-626.

An analysis of the difficulties encountered by 625 high-school graduates in applying 16 principles of pronoun usage found in the Guiler-Henry Diagnostic Test in Grammatical Usage.

HAVEN, S. EDSON. "The Relative Effort of Children of Native vs. Foreign Born Parents," *Journal of Educational Psychology*, XXII (October, 1931), 523-535.

A statistical study from which the author concludes that children of foreign

born parents secure higher achievement quotients than children of native born parents. Bibliography.

HURD, A. W. "The Workbook as an Instructional Aid," *School Review*, XXXIX (October, 1931), 608-616.

An experimental study of the lecture and supervised-study, work-sheet method. The experimental findings were somewhat in conflict; the author concludes that work sheets tend to help pupils, but that they are not indispensable.

KNIGHT, F. B., AND FORD, E. "Temporary Lapses in Ability and Error in Arithmetic," *Elementary School Journal*, XXXII (October, 1931), 111-124.

Temporary lapses in ability rather than a thorough-going disability account for error in certain definite situations. The author offers evidence that difficulty is a function of position, attention, fatigue, etc.

LEE, DORRIS MAY, AND LEE, J. MURRAY. "Some Relationships Between Algebra and Geometry," *Journal of Educational Psychology*, XXII (October, 1931), 551-560.

A study of the relationship between algebra and geometry from the use of marks, achievement test scores, and ability test scores.

LOOMIS, CHARLES P., AND MORAN, ANNA MAY. "Relation Between Use of Different Parts of Speech in Written Composition and Mental Ability," *Journal of Educational Psychology*, XXII (September, 1931), 465-475.

In this experimental study the author finds the coefficient of correlation between the percentage of articles used and mental age is .52, between the percentage of articles and vocabulary test .48, and between the percentage of articles and the average school grades .51.

MCELWEE, EDNA WILLIS. "A Study of Retardation and Special Instruction in Reading," *Elementary School Journal*, XXXII (October, 1931), 135-143.

Six experimental groups of 30 children each were studied. The author finds that special instruction to small groups, classified homogeneously, decreases retardation.

MEILI, RICHARD. "With Respect to the Theory of Factors (*A Propos de la Théorie des Facteurs*)," *Archives de Psychologie*, XXII (December, 1930), 328-332.

A response to Spearman's article in the same issue of *Archives de Psychologie*.

OLSON, WILLARD C. "A Study of Classroom Behavior," *Journal of Educational Psychology*, XXII (September, 1931), 449-454.

A study of the amount of whispering in an elementary school. The evidence suggested that the more intelligent and scholarly whispered somewhat less than the other children.

SPEARMAN, C. "The Theory of Factors (*La Théorie des Facteurs*)," *Archives de Psychologie*, XXII (December, 1930), 313-327.

Dr. Spearman presents his own point of view again, with criticisms of the points of view of Kelley and Meili.

TURNEY, AUSTIN H. "Intelligence, Motivation, and Achievement," *Journal of Educational Psychology*, XXII (September, 1931), 426-434.

The author presents data relative to 65 juniors and 48 seniors in the University of Minnesota High School on the inter-

correlations between marks, chronological age, mental age, industry, perseverance, dependability, and ambition. The data appear to emphasize the present and importance of the factor of motivation.

PUPIL ADJUSTMENT, GUIDANCE, AND WELFARE

GUNDLACH, RALPH H., AND GERUM, ELIZABETH. "Vocational Interests and Types of Ability," *Journal of Educational Psychology*, XXII (October, 1931), 505-511.

A statistical study from which the author concludes that the terms "social," "abstract," and "mechanical" cannot stand for three homogeneous, mutually independent, and collectively exhaustive categories of ability.

HARVEY, O. L. "Mechanical 'Aptitude' or Mechanical 'Ability'?—A Study in Method," *Journal of Educational Psychology*, XXII (October, 1931), 517-522.

A critical discussion of these concepts as employed in the Cox and Minnesota mechanical aptitude tests. There appears to be some confusion of concepts in the Minnesota tests. They are, however, superior to Cox's in internal consistency. Cox, on the other hand, seems to hold the more securely tenable theoretical position.

LEHMAN, HARVEY C., AND WITTY, PAUL A. "One More Study of Permanence of Interest," *Journal of Educational Psychology*, XXII (October, 1931), 481-492.

A statistical study of the vocational interests of children between 8½ and 18½ years of age, indicating that certain vocational interests cannot be permanent, that others may be more permanent, and that interests are symptomatic of ability only to a limited degree.

CURRICULUM RESEARCH

BAIRD, DON O. "A Vocabulary Study of Biology Notebooks of Fifty Representative Secondary Schools in New York State," *Journal of Educational Psychology*, XXII (October, 1931), 512-516.

A listing of words found in notebooks not found in Thorndike's *Teacher's Word Book*, from which the author concludes that biology has a technical vocabulary more or less peculiar to itself.

BROENING, ANGELA M. "Co-operative Curriculum Research in English," *Baltimore Bulletin of Education*, X (September, 1931), 10-13.

A summary of research studies pursued in the field of English in the Baltimore public schools during the academic year 1930-31.

OSBURN, W. J. "Constitution of Our Courses in Principles of Teaching," *Educational Administration and Supervision*, XVII (October, 1931), 544-551.

The author analyzes the contents of three books on the principles of teaching and finds that the term "principles of teaching" has little constant meaning as used in different teacher training institutions.

MEASUREMENTS, STATISTICS, AND METHODS OF EDUCATIONAL RESEARCH

CATTELL, PSYCHE. "Constant Changes in the Stanford-Binet IQ," *Journal of Educational Psychology*, XXII (October, 1931), 544-550.

When a Stanford-Binet Test is repeated within a period of three or four months the author finds that the experience gained from taking the first test results in a median gain of four or five points in IQ.

HEILMAN, J. D. "The Reliability of College Teachers' Classroom Tests," *Educational Administration and Supervision*, XVII (October, 1931), 535-543.

A summary of a study made to determine the reliability of instructors' classroom tests in the Colorado State Teachers College, 1930-31, from which the author finds that the reliability coefficients of teachers college tests vary from about .60 to .95.

KAULFERS, WALTER VINCENT. "Present Status of Prognosis in Foreign Language," *School Review*, XXXIX (October, 1931), 585-596.

Contains bibliography of 51 titles with a summary of the findings of these several investigations with reference to the status of prognosis in foreign language.

MISCELLANEOUS

CHARTERS, W. W., AND OTHERS. "Annual Report of the Bureau of Educational Research, Ohio State University," *Educational Research Bulletin*, X (September 16, 1931), 311-338.

Contains a general report of the Bureau of Educational Research of Ohio State University and its several divisions, namely, appointments, reference, editorial, tests, personnel, survey, curriculum, and motion picture studies.

CLAPARÉDE, E. "The Point of View of Psychology and the Point of View of the Subject (*Point de Vue du Psychologue et Point de Vue du Sujet*)," *Archives de Psychologie*, XXIII (April, 1931), 1-24.

A discussion of a number of misconceptions in the field of psychology growing out of the confusion of two points of view, namely, the point of view of psychology as a subject and the point of view of the subject. The author discusses introspection, the stimulus-error, subjectivity and objectivity, and *verstehende* and *erklärende* psychology from these two points of view.

HULL, CLARK L. "Goal Attraction and Directing Ideas Conceived as Habit Phenomena," *Psychological Review*, XXXVIII (November, 1931), 487-506.

The author discusses the matter of motivation by distinguishing between goal attraction and drive.

JENKINS, GLADYS GARDNER. "Factors Involved in Children's Friendships," *Journal of Educational Psychology*, XXII (September, 1931), 440-448.

The study includes 280 junior high-school boys and girls of Riverside, California. The author found a correlation of .716 for social-economic status of parents, .470 for chronological age, and .423 for mental age in the friendships of these boys and girls.

MEILI, RICHARD. "Perceptions of Children and the Gestalt Psychology (*Les Perceptions des Enfants et la Psychologie de la Gestalt*)," *Archives de Psychologie*, XXIII (April, 1931), 25-44.

The author offers experimental evidence to support the point of view that the integrations of children are simpler and more primitive than those of adults. Children are incapable of realizing complicated structures.

NEW TESTS

BLAISDELL, J. G. *Instructional Tests in Biology*. Yonkers-on-Hudson, New York: World Book Company, 1931.

A series of 25 tests consisting of 8 tests on animal biology, 6 on human biology, 7 on plant biology, and 4 summary tests on special and general subjects.

The Eighth Annual Nation-Wide Testing Program, conducted by the Public School Publishing Company, consists of three projects:

Project I.

SEATON, J. T., AND PRESSEY, S. L. *Seaton-Pressey Minimal Essentials Tests in English Composition.* Bloomington, Illinois: Public School Publishing Company, 1926.

PRESSEY, S. L. *Pressey Diagnostic Tests in English Composition.* Bloomington, Illinois: Public School Publishing Company, 1923.

Project II.

TORGERSON, T. L. *Public School Achievement Tests,* Forms 3 and 4. Bloomington, Illinois: Public School Publishing Company, 1931.

Project III.

SANGREN, PAUL V., AND REIDY, ANN. *Sangren-Reidy Instructional Tests in Arithmetic.* Bloomington, Illinois: Public School Publishing Company, 1931.

GLENN, EARL R., AND OBOURN, E. S. *Instructional Tests in Physics.* Yonkers-on-Hudson, New York: World Book Company, 1931.

A series of 25 tests in physics similar to the chemistry tests described below.

GLENN, EARL R., AND WELTON, LOUIS E. *Instructional Tests in Chemistry.* Yonkers-on-Hudson, New York: World Book Company, 1931.

A series of 36 tests dealing with chemical phenomena and principles, industrial processes, vocabulary, numerical problems, laboratory work, interpretation of diagrams, and biography.

GREENE, H. A., JORGENSEN, A. N., AND KELLEY, V. H. *Iowa Silent Reading Test.* Yonkers-on-Hudson, New York: World Book Company, 1931.

The test measures four major aspects of silent reading ability, namely, comprehension, organization, ability to locate information, and rate of reading. The tests are designed for use in grades nine to thirteen, inclusive.

LEONARD, EDITH M. *Rating Sheet for Predicting Teaching Success.* Boston: Houghton Mifflin Company.

A graphic rating scale covering personal and professional equipment of teachers, the technique of teaching, and results.

LEONARD, J. PAUL. *Leonard Diagnostic Test in Punctuation and Capitalization.* Yonkers-on-Hudson, New York: World Book Company, 1931.

This test enables the teacher to determine the extent of pupils' mastery of correct punctuation and capitalization practices. There are two forms, equal in difficulty, for use in grades five to twelve.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Editor Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

How Three National Surveys of Education Are Progressing.—For the first time in its history, the Office of Education, U. S. Department of the Interior, is conducting three national education surveys: (1) Secondary Education, (2) Teacher Preparation, and (3) School Finance.

Forty-nine types of inquiry forms in the Secondary Education Survey were sent out to approximately 22,000 high schools, public and private. Approximately 15,000 schools, through the coöperation of state superintendents, city superintendents, and principals, returned the questionnaires to the Office of Education.

On the basis of the information obtained, schools to be visited were selected. Personal visits by fourteen specialists extended over a period of four months last Spring, each specialist traveling an average of from 10,000 to 15,000 miles. Visits were made to schools whose inquiry forms showed new practices or to those recommended by state authorities and informed educators as being progressive.

During the summer, data on all inquiry forms were tabulated and this fall the data will be organized and prepared for publication. This survey will be completed June 30, 1932. L. V. Koos of the University of Chicago is associate director of the Secondary Education Survey.

The twenty-four projects which make up this survey and the specialists in charge are as follows:

1. Secondary-School Reorganization,—Francis T. Spaulding, Harvard University; and O. I. Frederick, Office of Education.

2. Horizontal Organization and Secondary-School Population,—Grayson N. Kefauver, Columbia University; and Victor H. Noll and C. Elwood Drake, Office of Education.

3. School-District Organization for the Administration and Supervision of Secondary Education,—Fred Engelhardt, University of Minnesota; and William H. Zeigel, Office of Education.

4. Special Problems in Reorganization,—William M. Proctor and Scovel S. Mayo, Stanford University.

5. Characteristics of Small High Schools,—W. H. Gaumnitz and P. Roy Brammell, Office of Education.

6. Study of Selected Secondary Schools in Smaller Communities and Rural Areas,—Emery N. Ferriss, Cornell University; and P. Roy Brammell, Office of Education.

7. Guidance,—William C. Reavis, University of Chicago.

8. Administrative and Supervisory Staff,—Fred Engelhardt, University of Minnesota; and William H. Zeigel, Office of Education.

9. Practices in the Selection and Appointment of Teachers,—W. S. Deffenbaugh and William H. Zeigel, Office of Education.

10. Provisions for Individual Differences, Marks and Marking Systems, and

Plans for Promotion for Pupils,—Roy O. Billet, Office of Education.

11. School Publicity,—Belmont Farley, National Education Association.

12. Curriculum,—A. K. Loomis, University of Chicago; and E. S. Lide, Office of Education.

English,—Dora V. Smith, University of Minnesota.

Foreign Languages,—Helen M. Eddy, University of Iowa.

Music,—Anne E. Pierce, University of Iowa.

Mathematics,—E. S. Lide, Office of Education.

Science,—Wilbur L. Beauchamp, University of Chicago.

Social Studies,—Wm. G. Kimmel, University of Minnesota.

13. Extra-Curriculum Activities and Non-Athletic Inter-Scholastic Contests,—William C. Reavis and George E. VanDyke, University of Chicago.

14. Intra-Mural and Inter-Scholastic Athletic Contests,—P. Roy Brammell, Office of Education.

15. Articulation of High Schools and Colleges,—P. Roy Brammell.

16. Physical Education and Health Supervision,—P. Roy Brammell.

17. Legal and Other Regulatory Provisions Affecting Secondary Schools,—Ward W. Keesecker, Office of Education.

18. Research Initiated by the Schools,—William H. Zeigel, Office of Education.

19. Supervision of Instruction,—Roy O. Billett and O. I. Frederick, Office of Education.

20. Registration and Schedule Making,—B. Lamar Johnson, Office of Education.

21. Library Service,—B. Lamar Johnson.

22. Special Reorganizations,—Leonard V. Koos, University of Chicago.

23. Secondary Education for Negroes,—Ambrose Caliver, Office of Education.

24. Growth and Trends in Public Junior Colleges,—O. I. Frederick, Office of Education.

A total of 980,000 questionnaires were sent out by the Office of Education for the Teacher Education Survey to all public-school employees from the nursery school to junior college. Approximately 463,000 were returned, state returns averaging from 9 percent to 75 percent. New Jersey teachers returned the most inquiry forms, while Pennsylvania teachers were a close second.

One-third of the questionnaires were sent direct to city superintendents in cities of 10,000 population, and the remaining two-thirds were distributed by state superintendents to areas of less than 10,000 population. From March 1 until June 15 returns were handled and data were transferred to cards which are being sorted and mechanically tabulated.

This national study of teacher preparation is expected to furnish for the first time, definite data on teacher supply and demand and qualification of America's teaching personnel. Information also will be forthcoming on sex and marital status of teachers, teaching experience, salary, teaching load, description of work, other school responsibilities, employment, etc. Statistical compilations should be completed by November 1, after which time interpretations will be made and reports will be written.

The various projects investigated and the specialists in charge were listed in the June number of this department. E. S. Evenden of Columbia University is associate director of the Teacher Education Survey.

The National Survey of School Finance, which will extend over a period of four years at a cost not to exceed $350,000,

was begun July 1. Recently the Secretary of the Interior appointed seventeen finance specialists in various parts of the United States to act as advisors to those actually engaged in the survey work. These specialists are: William G. Carr, Director of Research, National Education Association, Washington, D. C.; Lotus D. Coffman, President, University of Minnesota, Minneapolis, Minn.; Albert S. Cook, State Superintendent of Schools, Baltimore, Md.; N. R. Crozier, Superintendent of Schools, Dallas, Tex.; Fred R. Fairchild, Professor of Political Economy, Yale University, New Haven, Conn.; Mark Graves, State Tax Commissioner, Albany, N. Y.; Robert M. Haig, Professor of Business Administration, Columbia University, New York, N. Y.; Arthur N. Holcombe, Professor of Government, Harvard University, Cambridge, Mass.; L. F. Loree, President, Delaware and Hudson Railroad, New York, N. Y.; Harley L. Lutz, Professor of Public Finance, Princeton University, Princeton, N. J.; Felix M. McWhirter, President, Peoples State Bank, Indianapolis, Ind.; Fred W. Morrison, State Tax Commissioner, Raleigh, N. C.; Henry C. Morrison, Professor of Education, University of Chicago, Chicago, Ill.; Orville C. Pratt, Superintendent of Schools, Spokane, Wash.; George D. Strayer, Director, Division of Field Studies, Teachers College, Columbia University, New York, N. Y.; Fletcher Harper Swift, Professor of Education, University of California, Berkeley, Calif.; and Rolland A. Vandegrift, Director of Finance, State Department of Finance, Sacramento, California.

Paul Mort, Teachers College, Columbia University, is associate director in active charge of the Finance Survey. At a meeting in the office of Wm. John Cooper, U. S. Commissioner of Education, who is the director of all three surveys, Dr. Mort on September 4 outlined plans of the Finance Survey to Negro educators. The advisory committee met for the first time with Commissioner Cooper and Dr. Mort on September 14.

Preliminary survey investigations are being made by Timon Covert, Federal Office of Education specialist in School Finance; Eugene S. Lawler, Senior specialist in the Finance Survey; Carter Alexander, Teachers College, Columbia University; Mabel Newcomer, Professor of Economics, Vassar College; and eight other specialists.

University of Chicago Survey.—In 1924, the General Education Board made a grant of funds to the University of Chicago for a survey of that institution. Due to a series of changes which took place in the administration of the university following that year, the actual work on the investigation to be made under this grant was not begun until October, 1929. The survey has now been under way two years, and it is hoped that it will be completed not later than October, 1932.

The staff responsible for carrying out the survey program is composed of the following members of the faculty of the University of Chicago: Frederick J. Kelly, now of the Office of Education; John Dale Russell, Associate Professor of Education; George A. Works, Professor of Education and Dean of Students and University Examiner; and Floyd W. Reeves, Professor of Education and Director of the Survey. A number of special investigators also have been appointed to work on individual survey projects. This group includes members of the staff of the university, advanced graduate students, and experts in special fields who are not members of the university staff or graduate students.

The survey deals with the following topics: (1) the growth of the university, (2) organization and administration, (3) admission and retention of students, (4) the academic staff, (5) cost studies, (6) student aid, (7) curriculum and instruction, (8) research activities, (9) studies of students and graduates, (10) the physical plant, (11) extension activities, (12) the Laboratory Schools, (13) the University Press, (14) the libraries, and (15) the Oriental Institute. Many of these studies are now nearing completion and it is expected that some of them will appear in published form by the summer of 1932.

Survey of Methodist Schools.—The survey of the educational institutions affiliated with the Methodist Episcopal Church, begun in September, 1929, is rapidly approaching completion so far as two of the units of the survey are concerned. Each of the thirty-five institutions included in the unit consisting of the four-year colleges has been visited and has been given a final report. These reports, many of which were issued in mimeographed form at the request of the college concerned, contain from 250 to 400 pages. The topics treated are indicated by the titles of the various chapters which are as follows: (1) History and Service of the Institution; (2) Control, Organization, and Internal Administration; (3) Physical Plant and Equipment; (4) Library; (5) Program of Studies; (6) Faculty; (7) Improvement of Instruction; (8) Religious and Moral Influence; (9) Accounting and Budgetary Procedure; (10) Cost Studies; (11) Sources of Revenue; (12) Management of Endowment and Other Trust Funds; (13) The Students' Relation to the Finances of the Institution; and (14) A Future Program of Service for the Institution. Following the completion of these individual reports, in each case confidential to the college concerned, there is being prepared a summary volume covering the entire group of thirty-five colleges. It is hoped to have this final report off the press and ready for general distribution by January 1, 1932.

The field work on another unit of the Methodist survey has been completed. This unit comprises all the secondary schools and junior colleges. The topics treated follow the same general outline as that for the four-year colleges. Confidential reports already have been prepared for most of these institutions, and the writing of the final summary report is almost completed. It is hoped to have this volume off the press early in 1932.

Intensive work on a third unit of the survey—that dealing with the theological seminaries—was begun in September, 1931. According to present plans, the work on this unit will be completed during the current school year.

The survey of the Methodist educational institutions is under the direction of Floyd W. Reeves, Professor of Education at the University of Chicago. John Dale Russell, Associate Professor of Education at the University of Chicago, is serving as assistant director. The staff for the college unit consists, in addition to Reeves and Russell, of H. C. Gregg, formerly business manager of Albion College; A. J. Brumbaugh, Dean in the College, University of Chicago; and L. E. Blauch, Professor of Education, North Carolina College for Women. For the secondary-school unit, the staff has been composed of Reeves and Russell; Maurice Seay, Dean of Union College, Kentucky; and J. Carson Ryan, Director of Indian Education, United States Department of the Interior.

Yearbooks of the National Society for the Study of Education.—The National Society for the Study of Education expects to publish in February, 1932, its thirty-first yearbook. This volume will include Part I, entitled "The Teaching of Science" (prepared by the Society's committee under the chairmanship of S. R. Powers), and Part II entitled "Changes and Experiments in Liberal Arts Education" (prepared by a committee under the chairmanship of Kathryn McHale).

According to the publication program of the Society, it is expected that there will appear in February, 1933, a yearbook to comprise Part I on "The Teaching of Geography" (prepared by the Society's committee under the chairmanship of A. E. Parkins) and Part II on "The Activity Curriculum" (prepared by the Society's committee, until recently under the chairmanship of the late Professor Bonser, and for the continuance of which arrangements are being made).

The Society has under way yearbooks that will deal with "School Buildings and Equipment" (Chairman, N. L. Engelhardt) and with "Educational Planning" (Chairman, George Counts). Topics that have been recently proposed and which are still under consideration by the Board of Directors include "Techniques of Educational Diagnosis" and "Problems of the Superintendent."

Progress Report on Geography Yearbook.—The Geography Yearbook Committee (Steering Committee) of the National Society for the Study of Education held its third meeting at West Barrington, Rhode Island, early in September to read and discuss such papers as had been completed by the fifty or more collaborators. The papers included reports of group conferences, abstracts of studies completed before the yearbook was begun, and reports on studies and investigations prepared specifically for the proposed yearbook. The collaborators, who are in the main teachers of geography and teachers in actual service, are scattered from the Atlantic to the Pacific.

The next meeting of the National Council of Geography Teachers, which will be held at Ypsilanti, Michigan, during the Christmas holidays will be devoted almost exclusively to a discussion of the reports of group conferences on curriculums and to controversial points that are likely to be raised in the various reports of studies and investigations.

Classroom Teachers' Yearbook.—Character education in the public schools is the subject of the seventh yearbook of the Department of Classroom Teachers, to be published in June, 1932. The preparation of this book is in the hands of the following committee: Frederick L. Whitney (Chairman), Colorado State Teachers College, Greeley; Maude McBroom, Principal of the University Elementary School, Iowa City, Iowa; Faye Read, teacher in Lake View School, Pueblo, Colorado; Willa M. Marsh, Counselor in Theodore Roosevelt High School, Fresno, California; Mae T. Kilcullen, Assistant Superintendent of Schools, Kenosha, Wisconsin; and Kenneth L. Heaton, Director of Character Education, Pontiac, Michigan. The committee is being assisted by the Research Division of the National Education Association.

The purpose of the yearbook is to present principles, practices, and research findings in the field of character training in such a way as to be of the greatest practical value to classroom teachers. In aim and treatment it will differ considerably from the 1932 yearbook of the Department of Superintendence (also on character education), which will stress the

administrative viewpoint and will perhaps be more technical in its discussion of some phases of the subject. These two yearbooks, instead of overlapping to an objectionable degree, are intended to be complementary volumes which should prove unusually valuable to administrators and teachers alike.

Some of the main topics scheduled for discussion in the Classroom Teachers' yearbook are: (1) the problem of what to teach in character education, (2) activities in separate periods and separate courses of study in character education, (3) character activities in connection with the regular subject matter in regular class periods, (4) out-of-class school activities in relation to character development, (5) the case method and the individual pupil from the teacher's point of view, (6) the specialist's contribution to the teacher in the study of individual cases, (7) the effect of various methods of caring for individual differences in ability upon the development of character, (8) the home and the community in character education, and (9) other factors conditioning efforts to improve the character of pupils.

It is expected that the most valuable contribution of this volume will consist of a large number of illustrations of activities which teachers have found successful in furthering the development of good character in their pupils. This material, fresh from the field, has been collected by questionnaire through the Research Division of the National Education Association. Through this medium, the committee hopes to make the volume a truly practical handbook for classroom teachers in dealing with the ever-present problems of character education.

Elementary School Teachers' Yearbook.—The Principal and His Community is the title of the eleventh yearbook (1932) of the Department of Elementary School Principals. The general editorial direction of this volume is under the following committee: Aaron Kline (Chairman), Pullman Public School, Chicago; Isabel Tucker, Shenandoah School, St. Louis; and Helen B. Shove, Longfellow School, Minneapolis. Consultative and research guidance is given by the Research Division of the National Education Association.

It is the plan to make the 1932 yearbook a handbook on school-community relationships. Principals, superintendents, and teachers are preparing descriptions of safety patrols, health agencies, recreational clubs, playgrounds, and similar activities in which the school touches upon the life of the community. Laymen, also, have been asked to present their viewpoints on coöperation in educational and social enterprises.

In coöperation with the Research Division, the Editorial Committee has suggested an outline with the following major topics: (1) contacts with the home, (2) parent and teacher organizations, (3) community center activities, (4) school publicity, (5) service clubs, (6) social and charitable agencies, (7) excursions, (8) governmental activities, and (9) non-school and semi-educational activities.

In addition to the materials from the field, the compilers of the yearbook expect to include a study of one thousand elementary schools. This survey will indicate the types of non-educational organizations which are in contact with these schools. Other data will be presented to show the opportunities and dangers of propaganda.

It is expected that the various contributions will be integrated into appropriate chapters. Critical discussion will be presented by the Editorial Committee

and the Research Division, together with the necessary selected bibliographies.

Manuscripts were accepted by the Editorial Committee up to November 1, 1931. Revisions and changes will be negotiated by the Research Division during December, January and February. The yearbook will be available for distribution about April 1, 1932, at $2.00 per copy. Members of the Department of Elementary School Principals receive the volume as part of the benefits of membership.

Research Division, N. E. A.—Publications of the Research Division of the National Education Association which have appeared between May 1, 1931, and September 1, 1931, include the following studies:

1. "Salaries in City School Systems, 1930-31." *Research Bulletin*, Vol. IX, No. 3, May, 1931. This bulletin summarizes the facts available as to the salaries of school employees in 1,632 school systems in 1930-31. Tables are arranged so as to give median, minimum, and maximum salaries in all population groups.
2. For additional detailed data, special salary tabulations are being prepared. Those already published are: Tabulations I-A to IV-A, "Salaries Paid Teachers, Principals and Certain Other School Employees, 1930-31"; and Tabulations I-B to III-B, "Salaries Paid School Administrative and Supervisory Officers, 1930-31."
3. "The Outlook for Rural Education" was issued in preliminary form in July, 1931, for the use of the conferences on rural education at Los Angeles. This study not only summarizes existing conditions and shows the need for remedial measures in rural education, but also suggests what these measures may be. Selected references accompany each problem presented. A revised edition will soon be published as a *Research Bulletin*.

The Research Division has coöperated in an editorial and a consultative capacity with regard to the publications of certain departments and committees of the National Education Association:

1. The *Sixth Yearbook* of the Department of Classroom Teachers was issued in June. It has the title, "The Economic Welfare of Teachers," and is a discussion of the principles of financial security and their application among teachers and teachers' organizations. Such topics as salaries, insurance, credit unions, retirement systems, and mutual benefit plans are included, along with an extensive annotated bibliography.
2. "School Organization" is the subject of the June number of the *Review of Educational Research*. This is the third issue of the Review which is published by the American Educational Research Association, a department of the National Education Association. A bibliography follows each chapter summary.
3. "Teacher Demand and Supply in the Public Elementary and Secondary Schools of the United States" is the subject of the 1931 report of the Committee on the Economic Status of the Teacher. The chief sources of data were state departments of education and state educational associations. This report will be reprinted as a *Research Bulletin*.

The Educational Research Service, maintained in coöperation with the Department of Superintendence, has issued two circulars since May 1, 1931:

1. "Size of Class in 101 Cities 30,000 to 100,000 in Population and 56 Cities under 30,000 in Population," Circular No. 6, May, 1931. This report summarizes the replies to a questionnaire issued October 27, 1930. Similar data for larger cities were issued in January.
2. "Education Discussed in Lay Magazines, June 1, 1931," Circular No. 7, June, 1931. This review of articles in non-educational magazines covers the period April 1, 1931, to June 1, 1931.

Pennsylvania Research Activities.—The office of Statistics and Research in the Department of Public Instruction, directed by Jonas E. Wagner, reports greatly increased activities during recent months. Approval by the Superintendent of Public Instruction of an enlarged program of responsibility for the immediate future has made it possible to institute steps looking toward a reorganization of the statistical and research service along lines of increased usefulness.

One of the most far-reaching changes that has taken place is the establishment of a policy which seeks to raise very definitely the professional level of the personnel in the office. Instead of a clerical group composed for the most part of persons with no particular statistical preparation, transfers gradually are being made in such a way that the former employees will be properly placed and in turn their positions taken by specially trained persons. As a first move in this direction, an assistant directorship has been created.

During the month of July, an entire set of new tabulating equipment of latest design was installed to take the place of an older type of machines. The new equipment includes one printing and listing tabulator, one automatic electric key punch, one automatic duplicating key punch, and one counting and printing sorter.

The work of the office recently has been organized in such a way as to take care of and render prompt service in connection with the continuous requests for information by the various committees working under the Commission for the Study of Educational Problems in Pennsylvania. This survey of education has been initiated by the Superintendent of Public Instruction and is being carried out in collaboration with the United States Office of Education. Its primary purpose is to inquire into the present status of education in the Commonwealth, with the thought of promoting a ten-year program of improvement and development. To this end committees already announced are now working on guiding principles, school organization and administration, school finance, and recodification of school laws. Additional committees will be announced from time to time.

Arrangements have been effected to assist the controller's office in providing certain types of financial information bearing on the state institutions administered through the Department of Public Instruction.

The last few months have seen the release of two Doctors' theses and a number of Masters' theses, all of which have been the result largely of information assembled and worked through in the office of statistics and research. This is true, likewise, of the Report of the State Commission to Study the Present Plan of

Financing the Public Schools in Pennsylvania.

A recent additional assignment by the Superintendent of Public Instruction imposes responsibility for the preparation of all publicity material of the Department. This includes preparation of all copy for the official section of the *Pennsylvania School Journal*, and all educational news to be reported currently to the press.

Research in Ohio.—The Educational Research Department of the Ohio Education Association has published a mimeographed list of the research activities of its members from May 1, 1930, to May 1, 1931. These activities are classified under three headings: studies completed, investigations under way, and publications. The work of compilation and editing was done by Josephine MacLatchy of Ohio State University.

Arkansas Division of Research.—The Legislature of 1931, after failing to provide sources of revenue necessary for increasing the state equalizing fund, appointed a special legislative Commission for the purpose of proposing permanent financial relief for the schools. A large part of the time of the Arkansas State Department Division of Research has been consumed in compiling data and information for this commission.

The new school code enacted in 1931 requires each school district to prepare a budget for its financial operations during the ensuing year. The Division of Research has spent considerable time working out practical forms and instructions for making the budgets, and has done considerable field work in assisting the county superintendents and local school officers in the preparation of the budgets. The new law requiring the budgets has created a considerable demand for school accounting systems on the part of county superintendents and local school officers. Significant progress has been made in setting up such systems.

Research at Indiana.—During the past year, the Bureau of Coöperative Research at Indiana University has completed several of the studies which were in progress the preceding year and has started work on other problems of significance in the field of educational research.

A number of studies made during the year have been presented at various conferences. One of these, "The Philosophy of Human Relations: Individual and Collective," was summarized before the National Council of Education at the N.E.A. meetings in Los Angeles last June. This source book and another, "The Psychology of Human Relationships: Individual and Social," were used as the basis of discussion at a group meeting of the World Federation of Education Associations in Denver last July.

The Bureau has continued its work of assisting the County Superintendents Association of Indiana in devising new-type semester tests for Grades III-VIII in all academic subjects. It also has coöperated with Purdue University and the State Teachers Colleges in developing high-school tests for the State of Indiana. Tests in first- and second-year Latin, first-year algebra, plane geometry, and biology were developed in the Bureau at Indiana University. The present plans are to continue this work during the current year.

Two bibliographies, one on school surveys and the other on the teaching of English, are now in process of publication, and the analysis of the content of textbooks, tests, courses of study, and workbooks in English language, which

was being worked out last year, is nearing completion. A study of purely local value which the Bureau has developed and published this year is a pamphlet on the "Requirements for the Preparation of Theses and Research Reports in the School of Education, Indiana University."

Among the studies recently undertaken by faculty members and graduate students are the following: "Model Lessons in International Understanding and Good Will;" "Study of the Teaching of Physical Education in Indiana;" "Supplement to the Bibliography on School Buildings, Grounds and Equipment;" "Selection and Training for Leadership;" and "History of Education in Indiana".

It is hoped that most of these studies can be ready for publication within a year, and that other problems may be undertaken as soon as time and funds permit.

Experimental Entrance Program at Southern California.—The University of Southern California will conduct a three-year experiment with a group of seventy selected entrants each year to measure the validity of tests of scholastic aptitude and of high-school marks as entrance criteria for admission to college. The experiment will be carried on in the College of Letters, Arts, and Sciences, beginning with the first semester 1931-32. Students entering on this program may, after the first year, transfer to another school or college.

For a number of years past, the University of Southern California has followed the policy of admitting to the freshman class in the College of Letters, Arts, and Sciences, only those high-school graduates who have presented entrance credentials showing a specified number of the fifteen required entrance units completed with recommending marks. The minimum number of recommended units accepted has been twelve, this minimum number being accepted only if the applicant's entire high-school record showed an average standing of "B," greater weight being given to the marks of the last two years in high school than to those of the first two years. During this time, as at present, it has been possible for applicants to remove entrance deficiencies by means of examinations in high-school subjects given by the College Entrance Examination Board. The project is in charge of a faculty committee of which F. C. Touton is chairman.

Recent Research in Pittsburgh.—The economic stress throughout the country makes it necessary to conserve all resources, both public and private. The depression probably will increase school enrollment and yet decrease school revenues for building and operating expenses. To meet such emergency, in part, a careful study was made of the utilization of a Pittsburgh high school by the Department of Curriculum Study and Research, directed by D. R. Sumstine. The study was based on the following objectives:

1. To find the extensity of the present use of the building.

2. To find the possible maximum utilization.

3. To set up, as a result of this study, an expedient and simple procedure by which a principal may survey the building under his own charge.

It was found that certain percentages of utilization would permit the following additions:

Percent of Utilization	Additions
100	1190 pupils
90	837 pupils
80	484 pupils
70	131 pupils

The studies on reading are becoming so numerous that they confuse rather than illuminate the reader. In spite of this fact the Department, in connection with the administration of the Sangren-Woody Reading Test to 30,000 pupils, suggested some remedial work in the seven basic skills measured by this test. These suggestions are reported in the May-June Number of *Pittsburgh Schools*. In an early number of this bulletin, a complete report of the test will be given. The study deals with the reading abilities of pupils in regular classes, in prevocational classes, and in trade-school classes.

The overlapping of duties among administrative officers of high schools is well known, although the extent of this overlapping is not known. A preliminary study of the duties of principal, vice principal, home-room teacher, vocational counselor, director of activities, and girls' adviser in Pittsburgh has been made. Some seven hundred duties have been catalogued and studied.

In teaching typewriting, there are certain skills apart from the automatic control of the keyboard essential to proficiency in this subject. The following non-letter errors have been studied: throwing the carriage, adjusting carriage, adjusting paper, spacing on the page, and operation of shift key and lock, backspace key, tabular key, tabular stops, and space bar. The following conclusions are suggested:

1. The high percentage of total inaccuracy (20 percent) indicates that this type of error is worthy of more attention.

2. Thirty-six of the fifty-two errors are made more than 10 percent of the time.

3. The list of errors, with percentage of inaccuracy and rank, furnishes a positive indication of the difficulty which the teacher may expect the student to encounter.

4. The list provides the basis for the construction of specific manipulation drills, which may be expected to improve these operations.

5. Although the data for makes of typewriters are not to be regarded as conclusive due to the small numbers (110 Underwoods, 31 Royals, and 47 Woodstocks), the Underwood, Royal, and Woodstock were accurate in the order named.

6. The suggestion is indicated by the data that some of the operations should be made more mechanical and less manual.

7. Since an error study indicates difficulty, but not importance, further studies of this nature are needed.

The following courses of study have been completed and printed:

Art, Elementary Schools and High Schools.

Printing, Junior and Senior High Schools.

Chemistry, Senior High School.

Reading List, Junior and Senior High Schools.

Program of Studies, Junior and Senior High Schools.

Vineland Anniversary and Conference.—The Training School at Vineland, New Jersey, announces the twenty-fifth anniversary of the founding of the Vineland Laboratory. The occasion was recognized by holding an informal conference at Vineland, September 3-5, with Henry H. Goddard, the first Director of Research at Vineland, as guest of honor. The conference was attended by a small group of professional leaders in the fields of education, psychology, sociology, and medicine, who have been more or less intimately associated with the work at Vineland, including former members of the staff. The proceedings of the conference will be published in a memorial volume.

PERIODICAL
GENERAL LI
UNIV. OF

J
E

A Sug
Mid

Printi
Inst

Costs
to S

A Gra
Dist

Shorte

Editor

Reviev

Resear

Resear

Entere